“SUPERHEROES SOCIAL SKILLS”: AN INITIAL STUDY EXAMINING AN EVIDENCE-BASED PROGRAM FOR ELEMENTARY-AGED STUDENTS WITH AUTISM SPECTRUM DISORDERS IN A SCHOOL SETTING

by

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ABSTRACT

The current study evaluated the effectiveness of a multimedia social skills program in increasing the social engagement skills of 4 elementary-aged students with an autism spectrum disorder. The Superheroes Social Skills for Children with Autism program incorporates several evidence-based practices into one comprehensive curriculum, namely video-modeling, peer-mediated instruction, self-management strategies, and usage of social narratives. Generalization strategies are also embedded in the program. Typically developing peers, serving as "peer buddies," were nominated by their classroom teachers and participated in the social skills training. The intervention was implemented for 11 weeks with training occurring for 30 minutes twice per week in a public elementary school.

Effects were primarily assessed through 10-minute filmed observations taken during both analog free play and recess sessions for baseline, intervention, and follow-up phases. During these observations, each participant's percentage of time spent socially engaging, including both social initiations and responses, was coded using an adapted version of the Bellini (2007) social observation system. Both effect sizes and the percentage of nonoverlapping data points (PND) were calculated. Pre- and posttreatment effects were evaluated for the Social Responsiveness Scale (SRS) and the Autism Social Skills Profile (ASSP). Consumer satisfaction, social validity, and treatment integrity factors were also examined.

Results indicated that the Superheroes Social Skills for Children with Autism program was successful in enhancing participants' social engagement with peers. Larger effects were demonstrated in the generalization setting (i.e., recess). Effects were maintained over a 2-week follow-up period. The PND was a more conservative measure of effectiveness in comparison to effect sizes. There were also positive increases in participants' social skills and competencies as reported by parents and teachers on the SRS and ASSP. The intervention was easy to implement with fidelity and was rated as being socially valid, acceptable, and effective by all consumers.

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CHAPTER 1

INTRODUCTION

Both Autistic Disorder and Asperger's Syndrome fall under the overall umbrella of the Pervasive Developmental Disorders. These disorders are also commonly referred to as autism spectrum disorders (ASD) by professionals because their features fall on a continuum of severity and have in common deficits with social reciprocity, unusual patterns of communication, and restricted and/or repetitive interests and behavior (American Psychiatric Association, 2000). Once considered to be a rare disorder first assessed in early childhood, current prevalence rates for autism spectrum disorders are increasing (Fombonne, 2005) and estimates suggest that every one child in 110 children is affected with an ASD (CDC, 2009). Some researchers posit that the rise can be explained by expanding diagnostic nomenclature, improved detection methods, and better public awareness (Fombonne, 2005; Gernsbacher, Dawson & Goldsmith, 2005; Kielinen, Rantala, Timonen, Linna & Moilanen, 2004; Wing & Potter, 2002). Whatever constitutes the increasing rates, as more children are diagnosed with an autism spectrum disorder it becomes crucial to understand what treatments are most effective in helping to ameliorate the core symptoms children display.

Social Deficits in Individuals with ASD

Individuals with ASD must exhibit deficiencies with verbal and nonverbal communication as well as "oddities" in their interests and behaviors relative to their peers in order to meet current diagnostic criteria (APA, 2000). Typical language development coupled with average to above average intelligence and adaptive abilities differentiate those individuals diagnosed with Asperger Syndrome (APA, 2000). However, there is debate among researchers as to whether there is a true qualitative difference between Asperger's Syndrome and high-functioning autism (Elder, Caterino, Chao, Shacknai & De Simone, 2006; Macintosh & Dissanayake, 2006). Regardless, many would maintain that the cardinal characteristic of an autism spectrum disorder is the inability or difficulty to successfully relate to others socially (Fein, Pennington, Markowitz, Braverman & Waterhouse, 1986; Gutstein & Whitney, 2002; Weiss & Harris, 2001). This deficit in social relatedness could arguably be the most debilitating of all the diagnostic considerations (Rogers, 2000) and appears to persist throughout the lifespan (Bernard, Harvey, Potter & Prior, 2001; Eaves & Ho, 2008; Gillberg, 1991; Howlin & Goode, 2000; Howlin, Goode, Hutton & Rutter, 2004; Njardvik, Matson & Cherry, 1999; Sigman et al., 1999; Szatmari, Bartolucci & Bremner, 1989; Venter, Lord & Schopler, 1992).

Individuals on the autism spectrum have difficulty interacting socially through nonverbal forms of communication. For example, eye contact may be fleeting, excessive, or disjointed. Joint attention skills such as referencing social stimuli, shifting eye gaze to communicate, or generating gestures to express interest may be limited (Gutstein & Whitney, 2002; Weiss & Harris, 2001). Emotional coordination skills, including reciprocal smiling and the demonstration of feelings, may be missing (Gutstein &

Whitney, 2002). Additionally, individuals may lack the ability to interpret nonverbal overtures and clues, such as the ability to read facial expressions (Weiss & Harris, 2001).

Along with nonverbal communication skills, difficulties with expressive social communicative abilities may also be present in individuals on the autism spectrum. The ability to modulate a conversation, such as topic maintenance and repair, may be impaired (Gutstein & Whitney, 2002). Individuals may not recognize how and when to initiate and terminate a conversation, or may be verbose in certain topics. Additionally, they may find it difficult to establish alternate ways of expressing an idea or discontinue the topic being explored when the listener is confused or disinterested. Conventional humor may also be lost (Weiss & Harris, 2001).

Many people with ASD also struggle with conveying empathy or exhibiting an awareness of another person's perspective or distress (Weiss & Harris, 2001). In fact, Gutstein and Whitney (2002) assert that the key deficit in people with Asperger's Syndrome is the inability to share experiences, which is the basis of establishing and cultivating human relationships. These researchers posit that although some affected children have the capacity and do extend social initiations to others, albeit much less frequently and successfully than their nondisabled peers, it is generally to provide information and not purely for the sake of interacting (Gutstein & Whitney, 2002).

Subsequently, children with ASD tend to have fewer friends than typically developing peers (Knott, Dunlop & Mackay, 2006; Koning & Magill-Evans, 2001), and often require assistance in the facilitation of peer relationships by family members (Bauminger & Kasari, 2001). Difficulty with friendships has also been shown to sometimes get worse with age (Knott et al., 2006). Youth with ASD may often

experience loneliness, anxiety, exclusion, and bullying because of their social difficulties (Bauminger, Shulman & Agam, 2003; Bellini, 2004; Church, Alisanski & Amanullah, 2000; Little, 2002).

Two studies outlined the specific social deficits children with ASD display through utilization of self-report methods (Knott et al., 2006; Macintosh & Dissanayake, 2006). School-aged children between the ages of 4 and 10 who are diagnosed with either high-functioning autism or Asperger's Disorder, which is often synonymous with Asperger's Syndrome, showed similar impairments in their cooperation, assertiveness, and self-control skills in comparison to their typical peers as reported by both teachers and parents on a standardized social skills rating scale (Macintosh & Dissanayake, 2006). Additionally, both affected groups demonstrated elevations in internalizing and externalizing behaviors relative to their peers (e.g., hyperactivity).

The second study, conducted by Knott and colleagues (2006), demonstrated that when children with ASD were asked to rate their social skills, the scores fell one standard deviation below the mean on structured questionnaires. Parents' ratings, on the other hand, showed skills falling almost two standard deviations below the mean. Thus, although not quite aligned with the answers of their parents, the youth were shown to be aware of certain social deficiencies. Both groups reported difficulty with temper management, assertiveness, and social engagement, while the parents additionally noted on an informal measure deficits in conversation skills and peer relationships, inappropriate behaviors, and deficiencies in socio-emotional reciprocity.

From the very early stages of life, deficits in social development are evident in children with ASDs (Sigman, Dijemco, Gratier & Rozga, 2005). Specifically, young

children exhibit problems with imitation skills, display abnormal patterns of social play, fail to respond to various social cues, and show aversion of gaze. General lack of awareness, impaired friendships, and difficulties with imaginative play and nonverbal forms of communication are also apparent from a young age (Stone, Hoffman, Lewis & Ousley, 1994).

Conceptualization and Categorization of Socio-Emotional Functioning

Social Skills and Social Competence

Many have attempted to describe the construct of social skills, yet there is no overall consensus on a universal definition. The delineation between social skills and social competence has been made, with the former applying to the basic skills that allow a person to participate in interactions and the latter referring to the application of these skills, such as friendship development (Spence, 2002). Earlier work differentiated social skills as the explicit abilities an individual employs to effectively manage typical social situations, from that of social competence, which was explained as the evaluative process parents, teachers, and peers make in response to how the individual relates socially (McFall, 1982). Gutstein and Whitney (2002) defined social competence as "the skills and strategies that allow individuals to have meaningful friendships; forge close, emotion-based relationships; productively collaborate with groups, teams, and work partners; manage public social settings; and participate in family functioning" (p. 161).

Social skills, on the other hand, were defined by Sheridan and Walker (1999) as "discrete, learned behaviors exhibited by an individual for the purpose of performing a task" (p. 686). The researchers added that these must be explicit, observable, and measurable. Conversely, social skills have also been described as specific behaviors

resulting in positive social interactions (Elliott & Gresham, 1987). Alternatively, other research has focused on the development of a taxonomy depicting social skills (Caldarrella & Merrell, 1997).

For example, in an empirical review of social skills rating scales and inventories, five broad behavioral dimensions were consistently identified that epitomize all social skills: 1) peer relational skills, 2) self-management skills, 3) academic skills, 4) compliance skills, and 5) assertion skills (Caldarrella & Merrell, 1997). The researchers proposed that this taxonomy be used in the identification, discussion, and treatment of children with social skills deficits. Table 1 provides specific examples of the types of social skills included in each of the five prosocial areas within Caldarrella and Merrell's (1997) dimensional framework.

Types of Social Skills Deficits

In the conceptualization of social skills, it is also imperative to be familiar with the various types of social skills deficits. Knowledge of specific deficits can often drive the treatment approach adopted. Four types of social skills deficits have been identified in the extant literature (Gresham, 1981, 2001). An acquisition deficit occurs when the individual does not possess the necessary skills to interact in an appropriately socially manner. Conversely, a performance deficit occurs when the individual has learned the particular social skill under scrutiny, but is unable to demonstrate it when required at a sufficient level. Fluency deficits, closely related to performance deficits, refer to individuals who are willing and able to convey a skill but the presentation of the skill is lacking in its delivery. Lastly, self-control deficits describe an individual who is unable

Table 1. Specific Skills Within Each Dimensional Area of Caldarrella and Merrell's Taxonomy of Prosocial Behaviors

Peer relations	Complimenting peers, providing needed assistance, initiating social interactions
Self-management	Controlling emotional states, following rules, compromising, receiving feedback appropriately
Academic	Assignment completion, independence, adherence to teacher direction
Compliance	Following rules and directions
Assertion	Beginning conversations, accepting compliments, initiating play, establishing friendships, self-confidence

to regulate and modulate aggression and impulsivity, which in turn interferes with social functioning. Deficits can be attributed to a variety of factors, including lack of knowledge, missed opportunity to learn or practice skills, interfering problem behaviors, and limited or no reinforcement of skills (Gresham, 1995).

Relevance of Social Skill Development

Common sense suggests that children who have adequate social skills and competence have better outcomes. Arguably, the ability to successfully navigate social relationships with both peers and adults is an essential part of the school experience, apart from the academic realm. Research has shown that the social skills and self-concepts of youth of varying behavioral and academic abilities affected their academic achievement

indirectly through their academic competencies (Ray & Elliott, 2006). Social competence is correlated to future success in life. Indeed, the manner in which children are able to cultivate and sustain integral relationships, deviate from harmful associations, and acquire respect and acceptance by peer groups is predictive of academic, social, and psychological functioning and outcome (Denham et al., 2001; Gresham, Sugai & Horner, 2001; Pelco & Reed-Victor, 2007).

General Issues in Social Skills Training

Targeted Social Behaviors

The purpose of most social skills training (SST) interventions is the remediation of skills that inhibit effective social functioning. Programs attempt to incorporate a variety of skills sets such as emotional development, conversational abilities, friendships, and social problem solving abilities (Kavale & Mostert, 2004). Although not meant to be all encompassing, some commonly targeted skills addressed in SST, as derived from commonly used curricula, include the following primary skills: following instructions; answering questions; initiating greetings; interrupting appropriately; accepting no, feedback, and correction; making requests and posing questions; reporting behavior; joining in; getting someone's attention; and making an apology (Fister, Conrad & Kemp, 1998). Additionally, higher level lessons added disagreeing; giving and accepting compliments; providing feedback and correction; expression of self; making introductions; engaging in conversations; resisting peer pressure; resolving a disagreement; and volunteering (Fister et al., 1998).

Development of Social Skills Training Programs

Lane and her colleagues (2004) created procedures intended to guide the development, implementation, and assessment of social skills interventions. Six steps were recommended: (1) identifying students for participation, (2) identifying specific skill deficits and designing the intervention program, (3) organizing intervention groups, (4) preparing intervention leaders, (5) implementing the intervention, and (6) monitoring student progress. Other essential elements consist of identifying skills that need to be remediated, teaching and modeling targeted skills, coaching and prompting application of the skills, providing opportunities to rehearse the skills, supplying reinforcement and feedback, implementing reductive procedures, and facilitating generalization (Gresham, 1995).

Types of Social Skills Training Programs

A multitude of socials skills intervention packages and curricula exist on the market today, available to practitioners in a variety of contexts. Some of these were derived from a research base, while others were not. Table 2 summarizes a few of the more common types of social skills training interventions and programs commercially available.

Evidence-Based Practice

As the availability and extensiveness of social skills programs continues to grow, it is imperative that these treatments be derived from empirical standards and vigorously tested through research. In the past decade, the importance of establishing evidence-based practices has been emphasized in a variety of contexts. This stems from a lack of

Table 2. Common Social Skills Training Programs for Youth

The ACCEPTS Program	Walker et al., 1983
ASSET	Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1981
Skill Streaming	McGinnis & Goldstein, 1984
Prepare Curriculum	Goldstein, 1988
Aggression Replacement Training	Goldstein & Glick, 1987
Cool Kids	Fister et al., 1988
Tough Kids Social Skills Book	Sheridan, 1995

connection often found between research and practice (Odom et al., 2005). As such, different professional associations and research organizations have provided definitions on what constitutes evidence-based practice, put forth position papers delineating evidence-based practice criteria, and outlined recommendations and guidelines as to how best achieve evidence-based practices for varying types of educational and psychological interventions and therapies. Many of the position papers from these groups have directly impacted policy in their respective fields.

Definitions

Since the term “evidence-based” was coined in the medical field, several definitions of evidence-based practice have been extended to education and psychology. For example, evidence-based practice (EBP) was described by Hoagwood, Burns and Weisz (2002) as a “body of scientific knowledge, defined usually by reference to research

methods or designs, about a range of service practices (e.g., referral, assessment, case management, therapies, or support services)" (p.3). Thus, evidence-based practices indicate the effect of a specific service on the particular patient being targeted (e.g., child, adolescent, or family) and the extent of scientific research that supports the service (Hoagwood & Johnson, 2003). Additionally, Cournoyer and Powers (2004) assert that evidence-based practices should:

> Whenever possible, be grounded on prior findings that demonstrate empirically that certain actions performed with a particular type of client or client system are likely to produce predictable, beneficial, and effective results… and every client system, over time, should be individually evaluated to determine the extent to which the predicted results have been attained as a direct consequence of the practitioner's actions. (p. 799)

Lastly, the American Psychological Association (2005) defines evidence-based practice in psychology as "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences."

National Association of School Psychologists (NASP)

The National Association of School Psychologists (2005) has acknowledged the usage of evidence-based practices in the effort to enhance student outcomes and promote quality services for children in educational settings. NASP identifies the challenges that are inherent in adopting evidence-based practices in schools, such as translating research findings into actual practice and the impact of implementation, usage, and acceptance variables. That being said, NASP emphasizes utilizing controlled studies in naturalistic environments that consider efficacy, feasibility, acceptability, social validity, treatment integrity, sustainability, organizational, and contextual factors (NASP, 2005). In order for these goals to be achieved, NASP encourages collaboration between researchers,

school psychology professionals, and other key stakeholders, such as parents, students, school personnel, administrators, and community members.

Kratochwill and Shernoff (2003), whose views have been expressed in NASP publications, have provided accounts on how evidence-based practices can be specifically incorporated into schools (NASP, 2007). They have highlighted the importance of shared responsibility between researchers and practitioners in the creation of evidence-based practices, guidelines for implementation (e.g., manuals and procedures) and efficacy (i.e., how and when to select an intervention), as well as access to professional development and preparation in the scientist-practitioner method.

American Psychological Association (APA)

A policy statement provided by the American Psychological Association (2005) supports the use of evidence-based practices in psychology to enhance effective psychological practice and promote public health wellbeing. Best research evidence (i.e., clinically relevant and internally valid), clinical expertise, and patient factors should all be considered when ensuring best practices outcomes. This conceptualization of evidence-based practices mirrors definitions used in medical contexts (APA Presidential Task Force on Evidence-Based Practice, 2006).

The APA Presidential Task Force on Evidence-Based Practices (2006) emphasizes the usefulness of multiple sources of evidence. While randomized clinical trials and meta-analytic research arguably hold the highest methodological rigor, other methods such as clinical observations, qualitative research, case studies, single-case experimental designs, public health and ethnographic research, as well as process-outcome studies, can also provide helpful results contributing to our scientific knowledge

of practices (APA, 2006). When evaluating intervention research, both treatment efficacy and clinical utility are also crucial components. It is the role of psychologists to be able to understand both the strengths and limitations of various evidence sources derived from different research designs. The APA Task Force also stresses cost-effective mental health services and accountability of practitioners (APA, 2006). Like NASP, APA recognizes the significance of forming partnerships between researchers and consumers.

In 1995, the APA Division 12 Task Force on Promotion and Dissemination of Psychological Procedures provided criteria for the identification of empirically validated treatments, later known as empirically supported treatments. Using practices that had been evaluated using randomized clinical trials, targeted a specific population, and which were implemented through usage of a treatment manual, they classified 18 well-established treatments (APA, 2006). Since the first publication, the number of efficacious treatments has been updated.

As defined by Chambless and colleagues (1998), well-established treatments must meet the following requirements: include a description of study participants, include treatment manuals, and be assessed by at least two independent research groups or investigators. At least two between-group design and nine single-subject design experiments are needed to meet the well-established criteria for a particular treatment. Results of the between-group studies must show a statistically significant difference between a placebo or another treatment, or equivalency to an already established treatment. Results of the single-subject studies must compare the targeted intervention to another treatment. Probably efficacious treatments are those that include two separate

experiments resulting in a statistically significant difference between the targeted treatment and a wait-list control group, an experiment that meets some of the well-established criteria, or less than three single-subject studies meeting well-established criteria. Although not without controversy, these guidelines are helpful in assessing which practices meet evidence-based criteria and assist in the development of research studies that employ thorough methodological standards.

U.S. Department of Education Institute of Education Services (IES)

In contrast to the APA Presidential Task Force which has a more lenient view of what types of studies are acceptable when evaluating interventions, the U.S. Department of Education IES National Center for Educational Evaluation and Regional Assistance (2003) asserts that randomized control trials (RCTs) are superior to other research designs. In fact, the IES insists that pre-post and quasi-experimental designs, as well as some meta-analyses that include lower caliber studies, are prone to flawed conclusions. Both the quality and quantity of the evidence needs to be considered when determining whether an intervention is effective (IES, 2003). To address the quality of evidence, a study should include a detailed account of the intervention, use valid outcome measures, have a low attrition rate, assess effects over time, use large sample sizes, and evaluate both statistical significance and the magnitude of an effect. To address the quantity of evidence, studies should utilize a RCT design, interventions should be assessed in typical settings (i.e., preferably matching the one being used in practice), and similar results should be obtained from independent studies (IES, 2003). Because it is not always feasible to meet the criteria for "strong" evidence of effectiveness, as listed above, the IES has additionally provided guidelines for "possible" evidence in comparison studies.

Council for Exceptional Children (CEC)

In 2003, the Council for Exceptional Children's (CEC) Division of Research initiated a task force to determine the effectiveness of special education practices and establish quality indicators (Odom et al., 2005). In part, this task force was created in response to the No Child Left Behind Act, which requires teachers to use research proven educational methods in their classrooms. Although educators are mandated to use these practices by law, the special education field has yet to generate specific criteria for the types and levels of evidence required to call a practice evidence-based (Odom et al., 2005). However, researchers have produced quality indicators for the following types of research designs: experimental, single-subject, correlational, and qualitative (Odom et al., 2005). The CEC's Professional Standards and Practice Committee is currently working on developing a process and set of criteria to identify evidence-based practices (CEC Today). They additionally have made recommendations to the IES, such as suggesting that evidence-based practice research be expanded to include preschool aged children and young adults.

American Speech, Language, and Hearing Association (ASHA)

Analogous to the APA Division 12 Task Force, and later the criteria put forth by Chambless and colleagues (1998), the American Speech-Language-Hearing Association has proposed that different types of practices may require separate levels of evidence (Odom et al., 2005). ASHA has adopted a framework that delineates how practices can be separated into four levels of evidence. Level I evidence includes information gathered from meta-analyses with a minimum of at least one randomized experimental design

study. Level II evidence consists of controlled studies without randomization and quasi-experimental designs. Well-designed nonexperimental studies, such as correlational and case studies, comprise Level III evidence. Level IV evidence is derived from expert committee report, consensus conference, and clinical experience from reputable sources. Similar to the standards put forth by APA, ASHA policy requires practitioners to use the components of evidence-based practice in their decision-making and care, viewing EBP as an integration of quality research, clinical expertise, and client factors (ASHA, 2005).

National Autism Council (NAC)

In a recent report, the National Autism Council (2009) outlined which educational and behavioral treatments are effective for children on the autism spectrum. They were able to accomplish this through what they called a "strength of evidence" classification system. The aim of publishing this report was to assist parents and professionals in selecting evidence-based practices. Using operationalized inclusion and exclusion criteria (e.g., youth had been identified as having an ASD, usage of peer reviewed articles, lack of medical comorbid conditions), the NAC surveyed the autism literature published between 1957 and 2007 and categorized treatments as being well-established, emerging, unestablished, or ineffective/harmful (NAC, 2009). To identify the treatments, the NAC assigned a rating scale to each study which evaluated its scientific merit by assessing research design, measurement of independent and dependent variables, eligibility criteria, and generalization. Treatment effect ratings, consisting of beneficial, ineffective, adverse, or unknown, were also applied to each study investigated.

Thus, established treatments were those that had the backing of numerous peer-reviewed articles, had high Scientific Merit Rating Scores (SMRS), and beneficial

treatment effects. Emerging treatments had the support of a few published studies, had lower SMRS scores, and beneficial treatment effects documented for only one dependent variable measured in the studies. Unestablished treatments were typically based on clinical report as opposed to actual research and had the lowest SMRS scores. Lastly, ineffective or harmful treatments were shown from the results of several studies, had midrange SMRS scores, and had either no beneficial or adverse treatment effects (NAC, 2009).

Meta-Analytic Research on Social Skills Training

Meta-analytic research investigating the treatment effectiveness of SST involves aggregating the results of many studies in a quantifiable manner with both group and single-subject designs (Quinn, Kavale, Mathur, Rutherford & Forness, 1999). The majority of studies utilizing this method have yielded negligible effects for children with emotional and behavioral disorders and learning problems (Kavale & Forness, 1996; Mathur, Kavale, Quinn, Forness, & Rutherford, 1998; Mathur & Rutherford, 1996; Quinn et al., 1999). However, other research posits that social skills training is moderately efficacious (Beelmann, Pfingsten & Losel, 1994; Schneider, 1992). Additionally, a more recent review of six meta-analytic studies concluded that SST is an effective intervention for children who have or are at-risk for developing emotional and behavioral disorders (Gresham, Cook, Crews & Kern, 2004). Specifically, these researchers found adequate construct, internal, and external validity in the studies investigated, although there was questionable social validity. In fact, SST resulted in a 64% improvement rate relative to controls, impacting externalizing, internalizing, and antisocial types of behaviors. Thus, the research base appears to be contradictory, namely because of the disparity of

statistical methods employed, varying interpretations of results obtained, heterogeneity of samples, and wide range of effect sizes cited in the literature among different meta-analyses (Gresham, 1997).

These studies do, however, emphasize that social skills training appears best applied to withdrawn children, those experiencing anxiety, and for the promotion of specific types of skills; and least effective for those displaying aggression and disruptive behaviors (Beelmann et al., 1994; Quinn et al., 1999; Schneider, 1992). Interestingly, in the Quinn et al. meta-analysis (1999), there was no significant difference between established social skills curricula and those interventions developed specifically to address the posited research questions.

The above issues imply that there are several viable directions to target in future studies. Research has shown that the maintenance and generalization effects obtained from commercially available social skills training programs are minimal (Du Paul & Eckert, 1994), so these areas must be advanced (Gresham, 1997). Additionally, it is essential that specific skill deficits are matched with corresponding interventions, training occurs in the most effective setting (e.g., such as the child's natural environment), and relevant outcome measures are used (Gresham, 1997; Quinn et al., 1999). Consideration of these factors will hopefully increase the treatment effects for children undergoing social skills training.

Social Skills Training Specific to Youth with ASD

Research has been conducted on social skills programs developed for children and adolescents with specific types of disabilities such as those with ASD. Practitioners working with youth with ASD have attempted to address their social deficits for several

decades and although improvements have been made, much more work still remains to be done. The history of social skills in the area of ASD has progressed from teaching basic foundational skills through behavioral analysis techniques, such as establishing eye contact and physical contact, to more specific and complex skill sets, including offering assistance, displaying various types of play, as well as making initiations and posing questions (Weiss & Harris, 2001).

Agents of Mediation

Both adults and peers can serve as mediators in the implementation of interventions designed to remediate social skill deficits in children and adolescents with ASD. Historically, adults were the primary agents facilitating social skills instruction until criticisms arose stating that this approach fostered the dependency of children on the adult interventionists, reduction in change of skills when adult support was withdrawn, and represented an overly intrusive method (Weiss & Harris, 2001). The concept of using peer-mediated strategies with children with ASD stemmed largely from the work of Odom and Strain (1984). The researchers described three types of social interactional techniques peers could adopt: proximity (i.e., grouping typically developing peers with those with ASD with no formal training procedures), prompt and reinforce (i.e., teaching the nondisabled peers to probe and reinforce certain behaviors), and peer initiation training (i.e., discretely instructing the peers how to make social initiations with the ASD children). Although more research needs to be done, both adult and peer mediated methods appear to have moderate success with youth with ASD (Weiss & Harris, 2001).

Packaged Curriculum

Although it is beyond the scope of this paper to expound every social skills training program currently on the market for children and adolescents on the autism spectrum, as the frequency with which new programs surface has exploded, several programs will be mentioned. Table 3 specifically highlights some of the programs being adopted in schools and clinics. Although many include research-based strategies specific to individuals with ASD, few of the commercially available programs have been empirically assessed for treatment efficacy.

Video Modeling

Video modeling is a specific strategy using a video presentation format where targeted behaviors are demonstrated with peers, adults, and oneself serving as the model (Bellini, Akullian & Hopf, 2007). The premise is that the individual with an ASD will view the video and imitate the appropriate behaviors successfully. Research has shown video modeling to be an effective intervention for teaching and promoting conversational speech (Charlop & Milstein, 1989), perspective taking (LeBlanc et al., 2003), pretend play (MacDonald, Clark, Garrigan & Vangala, 2005), complex play sequences (D'Ateno, Mangiapanello & Taylor, 2003), social initiations (Nikopoulos & Keenan, 2003, 2004), spontaneous requesting (Wert & Neisworth, 2003), appropriate responding (Buggey, Toombs, Gardener & Cervetti, 1999), and social engagement (Bellini et al., 2007), using a variety of the three model types with varying populations of children with ASD.

Table 3. Social Skills Programs for Youth with ASD

- Social Skills Training for Children and Adolescents with Asperger Syndrome and Social-Communication Problems (Baker, 2003)
- Social Skills Solutions: A Hands-On Manual for Teaching Social Skills to Children with Autism (McKinnon, 2005)
- Navigating the Social World: A Curriculum for Individuals with Asperger's Syndrome, High Functioning Autism and Related Disorders (McAfee, 2002)
- Building Social Relationships: A Systematic Approach to Teaching Social Interaction Skills to Children and Adolescents with Autism Spectrum Disorders and Other Social Difficulties (Bellini, 2006)
- Social Skills in Our Schools: A Social Skills Program for Children with Pervasive Developmental Disorders, Including High-Functioning Autism and Asperger Syndrome and Their Typical Peers (Dunn, 2005)
- Think Social: A Social Thinking Curriculum for School-aged Students (Winner, 2006)

The extant literature highlights certain important points relevant to video modeling as an intervention for children with ASD. For example, there is no evidence that the "self-as-model" is more efficacious than the "other-as-model" (i.e., peers or adults), as similar results were found with both formats (Sherer et al., 2001). Based on their findings, these researchers posited that the "self-as-model" approach may be more useful in addressing maladaptive behaviors or performance deficits, where as the "other-as-model" approach may be more suitable for acquisition deficits. More research is

needed to validate these conclusions as there have been no replications in the literature to date differentiating the two methods for youth with ASD. Researchers have found that in both methods, visual attending and visual processing skills may be related to the success of video modeling interventions (Buggey et al., 1999; Sherer et al., 2001).

Social Stories

Social stories are another intervention implemented with children on the autism spectrum (Gray, 2000). Essentially, social stories are intended to teach the child with an ASD how to respond in certain social situations they are likely to find challenging or intimidating by providing a script for them to follow that dictates how to respond. Additionally, adults such as parents, teachers, and practitioners, can use the social story to foster certain types of skills. These may include skills such as teaching the child how to initiate a conversation with a stranger or take turns on the playground. The social story introduces the situation, instructs the individual discretely and specifically how to behave, and explains the reactions others might have based on what the child does or says.

There are specific steps to creating a social story, such as the number, ratio, and type of sentences to include. For example, in writing a social story, Gray (2000) instructs that it is essential to include a descriptive sentence that introduces the topic in a fact-oriented and logical manner. Additionally, social stories incorporate perspective sentences that relate the thoughts of other people, directive sentences that dictate how the individual with an ASD should act or instructions on what to say, affirmative sentences that provide assurance and represent common cultural beliefs, and partial sentences that encourage making assumptions on how to handle a particular situation and foster

comprehension. As a guideline, it is recommended that there are 0 to 1 directive sentences and 2 to 5 descriptive, perspective, and/or affirmative types of sentences in each social story.

Research has shown that social stories are an effective intervention for students with ASD when used to promote social engagement and specific types of social skills such as seeking attention, initiating comments and requests, and making appropriate responses (Delano & Snell, 2006). Additionally, when presented in a multimedia format, social stories have been found to be moderately efficacious in improving students' functional behaviors (Hagiwara & Myles, 1999). A recent meta-analysis (Kokina & Kern, 2010) demonstrated that although social story interventions had low to questionable overall effectiveness, there were some factors that seemed to produce better results. Some of the variables discussed were:

1. Focus on reductions in inappropriate behaviors as opposed to teaching new skills,
2. Implement the intervention in a general education setting,
3. Have the students read the stories to themselves, if possible,
4. Social stories should describe a single target behavior,
5. The intervention should be brief (i.e., between 1-10 sessions),
6. Functional Behavioral Assessment (FuBA) data should drive the content addressed,
7. Conduct comprehension checks to verify understanding,
8. Elementary-aged students with autism or ASD made best responses,

9. Best used with students with higher levels of communication and social skills,
10. Students with low/moderate levels of challenging behaviors responded better, and,
11. Reading ability does not appear to be a factor.

These results are preliminary, meaning that some of the variables (e.g., educational level and use of FuBA) did not have many studies included in the meta-analysis. Teachers did view social stories as a socially valid intervention (Kokina & Kern, 2010).

Meta-Analytic Research

Recent meta-analytic research conducted on social skills interventions used with children and adolescents on the autism spectrum has targeted several areas. The areas include evaluating the overall efficacy of interventions aimed to increase social interaction skills (Miller, 2006) and school-based social skills interventions (Bellini, Peters, Benner & Hopf, 2007), as well as honing in on particular components of social skills training such as self-management (Lee, Simpson & Shogren, 2007) and video-modeling (Bellini & Akullian, 2007). The results of each of these will be addressed.

Miller's (2006) review of 30 studies in the extant literature, comprised of peer-mediated, collateral skills (e.g., academics, play, language, joint attention), and child-specific interventions, resulted in moderate gains in reciprocal social interaction overall. Peer-mediated strategies were the most effective. There was a statistically significant difference between peer-mediated and child-specific types of interventions, and a larger mean effect size for peer-mediated versus collateral strategies, although the latter

difference in effect sizes was not significant. Additionally, there was a cross-age effect, with collateral skills having more of an impact with younger children and peer-mediated strategies more efficacious with older individuals with ASD. There was no significant effect for participant characteristics such as intellectual ability, age, gender, language ability, or treatment duration and intensity.

Another recent meta-analysis specifically investigated social skills interventions for children with ASD in a school setting (Bellini, Peters, et al., 2007). This review of 55 studies conducted between 1986 and 2005 resulted in marginal effects overall for SST. Additionally, there were poor generalization effects, meaning that when skills were acquired, they did not transfer well to other settings. However, there were adequate maintenance effects, indicating that if youth did learn new skills, they tended to persist in the training environment. The best effects were seen in collateral skills interventions and the least effects for peer-mediated interventions. This constitutes the opposite trend from what Miller's (2006) meta-analysis found. Social skills training interventions were found to be moderately effective in the child's classroom and least effective in a pullout setting. Social validity and treatment integrity measures were rarely used in the studies examined so it was not possible to evaluate how well the treatments were implemented or to assess what the consumers thought about them. Bellini confirmed Gresham's (2001) supposition that it is critical to address dosage, setting, and fidelity elements in SST research, as well as align skill deficits to specific interventions.

The differing results in the above two meta-analyses could possibly be attributed to the unique settings, designs, and statistical procedures employed in each study. For example, the Bellini et al. (2007) studies calculated their results through PND, while the

Miller (2006) studies used hierarchal linear modeling (HLM). Additionally, the Miller meta-analysis included single-subject and group research designs; the Bellini et al. studies solely targeted the former. Lastly, the Belinni et al. meta-analysis focused primarily on school-based interventions.

Meta-analytic research has also shown that specific elements are effective interventions for youth with ASD (Bellini & Akullian, 2007; Lee et al., 2007). In the Lee et al. (2007) study, self-management was described as encompassing the following types of skills: self-monitoring, self-evaluation, and self-reinforcement. A review of 11 studies showed that these self-management techniques globally increased prosocial types of behaviors. There were no intervention or participant effects; however, there was a trend toward self-monitoring coupled with other forms of monitoring techniques resulting in the best effects. Additionally, self-management appeared to be more effective for elevating certain types of behavior, such as the individual's daily living skills, rather than enhancing their social skills. However, this was not a statistically significant finding. In the Bellini and Akullian (2007) study, both video modeling and video self-modeling were found to positively affect social communicative abilities, behavior, and the functional skills of youth with ASD. Their review of 23 studies also showed adequate maintenance and generalization effects, a result not often found in the social skills training literature.

Limitations of SST for Children with ASD

One of the more recent narrative reviews of social skills training for youth with Asperger's Syndrome and high-functioning autism was conducted by Rao, Beidel and Murray (2008). After reviewing 10 studies that met their inclusion criteria, the researchers concluded that although SST is commonly used with ASD children, there is

minimal empirical evidence to warrant this practice. Challenges include programs derived from a variety of theoretical viewpoints, varying program designs, and disparate lengths and intensities of treatment (Rao, Beidel & Murray, 2008). Additionally, most social skills training programs are developed for the continuum of autism spectrum disorders and do not specifically tailor to the individual needs of children and adolescents with high-functioning autism or Asperger's Syndrome (Cragar & Horvath, 2003).

Several recommendations to address the limitations in the SST literature were provided by Rao et al. (2008):

- Conduct further investigations of the social skill deficits specific to youth with Asperger's Syndrome (AS) and high-functioning autism (HFA) and match intervention programs to diagnostic categories and skill level abilities such as intellectual functioning and/or language capabilities (e.g., distinct programming for children with autism versus children with AS),
- Determine the efficacy of SST for youth with AS and HFA, initially through single-subject research designs, followed by more powerful designs like randomized, controlled, group designs, and then by follow-up studies assessing the short-term and longer-term treatment effects,
- Devise SST programs that encourage the generalization of effects outside of where treatment occurred, such as practice in novel settings or with unknown adults, and
- Design SST programs that can be easily implemented by trained and knowledgeable professionals, effortlessly incorporated into naturalistic settings

(e.g., schools and community centers) and which are comprehensive and manualized.

Generalization Issues

All social skills training interventions have inherent problems with the generalization or transfer of skills gained to other novel settings (Du Paul & Eckert, 1994). Programs for children with ASD are no different. As mentioned previously, Bellini, Peters et al. (2007) found poor effects for school-based interventions that employed a pullout service model as compared to implementing the SST in the general education context or with typical peers involved in the instructional process. The meta-analysis found that when the students did acquire skills, they were unable to apply them to new situations or settings. Several studies showing that children had initial gains after the implementation of SST failed to demonstrate maintenance effects over time and generalization to other settings (Hadwin, Baron-Cohen, Howlin & Hill, 1997; Hwang & Hughes, 2000; Ozonoff & Miller, 1995). Unless interventions possess emotional meaning for the individual, the skills will not extend outside of the training setting (Mesibov & Lord, 1997).

Related to this notion of things needing to have emotional meaning, is a new concept of creating generalization termed the "stickiness factor" introduced by Gladwell (2000). The stickiness factor is defined as "the specific content of a message that renders its impact as memorable." In explaining how this concept of stickiness works, Gladwell (2000) gives the example of how explicit elements embedded in a popular children's television show like Sesame Street, namely the Muppet characters that drew the audience's attention, encouraged the children to retain the educational information they

were receiving and then apply it in other settings. Muppets were "sticky" and stayed in the children's minds. Gladwell (2000) makes the analogy that "sticky" ideas are like a spreading virus. Essentially, how you structure the presentation of an idea or provide information can hugely impact its effect.

Heath and Heath (2007) expounded on the idea of stickiness. They report that "sticky ideas are understood and remembered, and have a lasting impact-they change your audience's opinions or behavior." There are six principles that make an idea stick: simplicity, unexpectedness, concreteness, credibility, emotions, and stories. These factors seem to be important in fostering the generalization of skills, and could be applicable to the success of social skills training programs such as the one under investigation in the current study.

Morgan and Jenson (1988) described several strategies that can enhance the generalization of skills children with behavioral disorders gain in specialized contexts such as special education into the general education classroom. Specifically, they discuss the positive impact of incorporating techniques such as using natural and varied reinforcement contingencies (e.g., peer attention, good grades, or teacher appreciation); teaching multiple examples of the targeted skill; utilizing peers to reinforce prosocial behaviors; involving students in the intervention through the use of self-monitoring, self-instruction, or self-reinforcement; integrating components of the intervention into all settings; "train loosely" by changing instructional variables; and merging components found in both environments so they more closely resemble each other (i.e., programming common stimuli).

The Assessment of Social Skills

General Methods

The socio-emotional functioning of children and adolescents can be measured in several ways and researchers have made use of a wide variety of methods. Merrell (2001) outlines six primary methods utilized by practitioners and researchers: 1) behavioral observation systems, 2) behavioral rating scales, 3) structured and unstructured interviews, 4) self-report measures, 5) projective-expressive techniques, and 6) socio-metric strategies. Although each strategy has its own strengths and limitations, Merrell (2001) purports that naturalistic behavioral observation systems and behavioral rating strategies more closely adhere to best practices and clearly should be included as principal sources when assessing social skills. Gresham (2001) concurs with this recommendation and additionally proposes that socio-metric strategies be considered. Each technique will be described.

Naturalistic behavioral observation is the preferred method of many behaviorally driven practitioner and researchers (Merrell, 2001) and involves utilizing trained observers that target and record behaviors as they naturally occur through the execution of operationally defined methods. Merrell (2001) asserts that the best settings to observe social behaviors are places where children interact with other children, such as at school during recess or lunchtime.

Some potential problems of observations include the time required to implement the procedure and train observers as well as various threats to internal validity such as observer reactivity.

Behavior rating scales are often used to address the limitations of employing other systems when evaluating social skills. According to Merrell (2001), they offer the following advantages: they are less expensive, provide information on essential but often times infrequent social behaviors, yield more reliable data than other measures such as projective techniques or unstructured interviews, rely on observations over time in a naturalistic setting by observers familiar with the individual, and allow someone who knows that individual to assess social skills when that individual is incapable of doing so themselves (e.g., due to limited verbal abilities and/or because of noncompliance issues). Additionally, behavioral rating scales can be used to assess a wide array of social skills or a very specific set of skills.

Interviewing and socio-metric techniques constitute "second line" (Merrell, 2001, p. 3) choices in the assessment of social skills, whereas projective-expressive techniques and self-report approaches fall within the final tier of the hierarchy of options to consider. Despite the functionality and flexibility afforded in interviewing process, the research base has not clearly delineated exactly how these formats can be used consistently and effectively. Although peer rating, peer nomination, and peer ranking strategies, classified as socio-metric methods, have been found to be both valid and reliable, they are not optimal due to the administration costs involved and the factor that they tend to be better indicators of acceptance as opposed to the measurement of actual social skills (Merrell, 2001). Projective approaches may aid in facilitating relationships during the assessment process and can be used to formulate future directions in the assessment of skills, but they lend little or no information regarding the individual's socio-emotional capacity. Likewise, although self-report measures are often helpful in assessing other constructs

such as anxiety, depression, self-concept, and personality development, there is minimal evidence that they are valid for individuals reporting on their own social skill deficits and competencies (Merrell, 2001). The one exception to this may be the self-report version of the Social Skills Rating System, developed by Gresham and Elliot (1990).

Measures Employed Specific to ASD Populations

There is a paucity of instruments available when it comes to specifically assessing the social skills and social competencies of individuals on the autism spectrum. Naturalistic observational methods are commonly used for this population in single-subject research. That being said, many of the measures have not been empirically validated. Therefore the reliability and validity is unknown. Operational definitions used to describe the targeted social skills and competencies also vary widely. Elder et al. (2006) conceptualized some of the apparent challenges when they asserted "instruments to evaluate outcome, as it pertains to a child's social skill ability, are also difficult to utilize due to the low sensitivity of these instruments to detect change and the lack of specificity to the area of social skills that the treatment may be targeting" (p. 636). Some of the observational systems and rating scales included in the literature base are outlined in Table 4.

Single-Subject Research

Definition

Single-subject research (SSR), synonymously referred to as single-case research, is a specific experimental design that documents changes in an individual's behavior,

Table 4. Observational Systems and Rating Scales Used to Assess Social Skills in Individuals with ASD

Instrument	Author
Rating Scales	
Social Skills Rating System (SSRS)	Gresham & Elliot, 1990
Social Responsiveness Scale (SRS)	Constantino, 2003
(There are adult, child, and preschool versions)	
Autism Social Skills Profile	Bellini, 2007
Observational Systems	
The Child Intervention Code	Kohler et al., 1995
The Social Interaction Code	Niemeyer & McCoy, 1989
MOOSES	Tapp, Wehby & Ellis, 1992
Peer Social Behavior Code / SSBD	Walker & Severson, 1992
Bellini's Social Observation System	Bellini et al., 2007

allowing for the demonstration of functional relationships between the intervention and effects on behavior. It involves the collection of specified data (i.e., dependent variable) over a specified amount of time, in baseline and experimental phases, for both single individuals or groups of subjects (Zahn & Ottenbacher, 2001). Descriptions of three types of SSR designs follow.

AB Designs

AB designs are the most common of all the SSR designs. They consist of a baseline period (A) where at least three data points or measurements are taken to record

the subject's behavior, and an experimental period (B) where the treatment being evaluated is implemented. Essentially, the baseline serves as a control phase. Variations are the ABA and ABAB designs, where after an initial baseline and treatment phase, the treatment is withdrawn, and in some cases, reintroduced to assess effects. The latter types of designs aim to eliminate other extraneous variables that may have accounted for individual behavioral changes.

Multiple-Baseline Designs

In multiple-baseline designs, the subject, behavior, or setting, is systematically varied while the other parameters remain consistent. For example, subjects may enter the treatment phase at different times, meaning that one subject may have three baseline data points and another subject may have five baseline data points prior to the onset of treatment.

Alternating Treatment Designs

In alternating treatment designs, a subject is randomly assigned to receive one discrete treatment and after a defined period of time commences a different specified treatment.

Analysis of Data in SSR

Data collected in SSR designs can be evaluated in numerous ways. The most commonly used method is visual analysis, where the data are provided in a graphical format and data trends, slope, and level changes, as well as variability, are investigated (Zahn & Ottenbacher, 2001). Although visual analysis has practical and clinical implications, it presents problems when effects are small, there is variation within the

baseline data, and when inconsistencies arise in the interpretations of the results. Thus, there has been a movement toward also including statistical methods when conducting analyses in SSR, such as the computation of effect sizes or the PND taken from the baseline and treatment phases of the intervention.

Advantages

In contrast to group designs, SSR can be conducted when it is difficult and costly to find large groups of individuals with similar clinical features (e.g., school populations of children presenting with autism spectrum disorder characteristics) (Zahn & Ottenbacher, 2001). Additionally, SSR imparts useful information not attained from other types of designs, is useful in evaluating treatment effects in rare cases, and provides a vital link and between research and clinical practice (Kazdin, 1981; Kratochwill, 1985).

A specific advantage of multiple-baseline designs is that they help to control for internal validity threats such as historical influences without having to reverse or withdraw the intervention (Harris & Jenson, 1985). That being said, alternate single-subject designs can also be useful in certain studies, such as when there are multiple subjects participating in the same experimental group, when staggering the baseline is undesirable because of costs and when it is not prudent or ethical to reverse or delay treatment (Harris & Jenson, 1985; Hayes, 1981; Watson & Workman, 1981). Harris and Jenson (1985) succinctly stated, "It is unethical to delay treatment and prolong client difficulties solely to meet the requirements of the experimental design… it also is impractical to delay treatment, because clients who do not receive help are likely to seek help elsewhere" (p. 122). Case in point, Mansell (1982) argued that AB designs with

replication are more effortlessly executed and equally suitable to multiple-baseline designs in certain circumstances.

Limitations

There are inherent external and internal validity threats in SSR designs. External validity refers to the ability to generalize treatment findings to a larger population. Because treatment effects may vary from individual to individual, criticisms have been made that the results obtained in SSR may not apply to all people (Zahn & Ottenbacher, 2001). In contrast, threats to internal validity include variables such as history, maturation, testing, instrumentation, statistical regression, mortality, and the combination of any of these, that are alternative explanations responsible for treatment effects (Christ, 2007; Kazdin, 1981).

Validity issues can be addressed through the replication of the intervention effects across subjects, varying types of behaviors, and environments (Zahn & Ottenbacher, 2001). Single-case research can be enhanced through the inclusion of valid and reliable assessment measures that are implemented repeatedly throughout treatment, clearly defined and standardized procedures, diverse and multiple subjects, explanation of the magnitude and duration of effects, as well as the incorporation of elements addressing integrity, social validation, generalization, and maintenance factors (Kratochwill, 1985). The robustness of the experiment will be elevated when a historical account of the chronicity of the investigated disorder and prior failed intervention attempts are provided (Kratochwill, 1985).

Kazdin (1981) provides similar recommendations to strengthen case studies: add subjects to the study, record the immediacy and magnitude of change from treatment over

time, include a heterogeneous sample, and note the stability of the problem (e.g., social skills) under investigation. A summative explanation was provided by the author:

> The manner in which the multiple case report is designed does not constitute an experiment, as usually conceived, because each case represents an uncontrolled demonstration. However, characteristics of the type of case study can rule out specific threats to internal validity in a manner approaching that of true experimentation. (p. 190)

Other Variables Affecting Treatment Effectiveness

Social Validity

Social validity has been described as the manner in which various treatment consumers perceive intervention efforts and is related to the social relevance of treatment goals and effects, as well as treatment acceptance (Carr, Austin, Britton, Kellum & Bailey, 1999). Shapiro (1987) defined social validity as the "evaluation of treatment by consumers" (p. 293). Indeed treatment acceptability, effectiveness, and consumer satisfaction are all related aspects of social validity. The degree in which consumers appreciate the treatment under evaluation is critical. This can be attributed to whether or not behavioral change occurs and how quickly, and the intervention type and personal characteristics displayed by the examiner (Shapiro, 1987).

Although the construct of social validity is often ignored by both researchers (Carr et al., 1999) and practitioners, arguably it is an essential component to an intervention. If a student, classmate, teacher, or parent has an adverse opinion of a particular treatment, or does not judge it to be effective, then implementation and response to intervention can feasibly be altered.

Treatment Integrity

Treatment integrity is the extent in which an intervention is executed as intended and prescribed. Also referred to as treatment fidelity, it is a key component impacting treatment efficacy (Wood, Umbreit, Liaupsin & Gresham, 2007) and in making inferences about a particular intervention's effectiveness (Lane, Bocian, Macmillan & Gresham, 2004). It is erroneous to assume that treatments are always implemented correctly (Lane et al., 2004). Having adequate acceptability ratings is also not solely sufficient. Research has shown that even when treatment acceptability ratings are high from a variety of consumers, when the treatment integrity is poor, the intervention can be rendered ineffective (Wood et al., 2007).

As with social validity, treatment integrity can too be overlooked (Lane et al., 2004; Perepletchikova, Treat & Kazdin, 2007; Power et al., 2005). For example, in an empirical review of all the school-based intervention studies cited in the *Journal of Applied Behavioral Analysis* conducted between 1991 and 2005, a mere 30% supplied treatment integrity data, while half of the included studies were at an elevated risk for treatment errors (McIntyre, Gresham, DiGenerro & Reed, 2007). Similarly, and particularly pertinent to the current investigation, less than 20% of the autism treatment studies conducted within the past 15 years have reported treatment fidelity data (Wheeler, Baggett, Fox & Blevins, 2006), although many would assert it is an integral part of social skills training (Gresham, 2001).

Purpose of the Research

Individuals with ASD experience a wide array of social difficulties, in turn impacting their functioning and outcome across the lifespan. Thus, it is of the utmost

importance to investigate what interventions are most effective in the remediation of social skills deficits and which also engender social competencies. Although social skills training programs designed for children and adolescents with ASD are becoming increasingly popular and commercially available, research validating their use is minimal. Because children spend so much time in school and undoubtedly have an unlimited opportunity to experience social interactions and relationships with both peers and adults, this is the ideal environment to conduct such explorations.

This study proposes to evaluate the effectiveness of a comprehensive social skills training intervention, the Superheroes Social Skills for Children with Autism program, with four elementary-aged students with high-functioning autism and Asperger's Syndrome, or what will be referred to in this study as ASD. The manualized social skills curriculum is comprised of empirically validated techniques that have been shown to be efficacious with students with ASD, such as inclusion of nondisabled peers, video modeling, social narratives in the format of a comic book, and generalization and self-management components. The unique yet motivating aspect of employing superheroes as agents of instruction, in contrast to the more traditional didactic instruction students with ASD can receive, serves as a way to address issues such as visual attending.

The current study also sought to advance the research literature in several other ways. First, the intervention was implemented with a specific sample of ASD individuals, namely those diagnosed with high-functioning autism or Asperger's Syndrome. Historically, although this population of individuals may benefit the most from social skills training, relatively few programs exist that specifically target these individuals. Secondly, because the curriculum is designed to be easily followed and

implemented, there are significant practical implications for clinicians if it is shown to be efficacious. This may assist in bridging the gap between research and practice. Lastly, the intervention program will include assessment of treatment fidelity, consumer satisfaction, and social validity – all crucial constructs that are too often ignored in the literature, yet imperative in describing treatment effectiveness.

Research Questions

1. *What is the overall effectiveness (e.g., effect size and percentage of nonoverlapping data points) of Superheroes Social Skills for Children with Autism, as measured by observational data taken during the analog free play period in the training setting*? *(Measured by Bellini's (2007) social interaction observation system.)*

2. *What is the overall effectiveness (e.g., effect size and percentage of nonoverlapping data points) of Superheroes Social Skills for Children with Autism, as measured by observational data taken during a naturalistic setting, such as recess? (Measured by Bellini's (2007) social interaction observation system.)*

3. *What is the overall effectiveness of Superheroes Social Skills for Children with Autism, as measured by pre- and postquantitative change scores from parent and teacher versions of the Social Responsiveness Scale?*

4. *What is the overall effectiveness of Superheroes Social Skills for Children with Autism, as measured by pre- and postquantitative change scores from parent and teacher versions of the Autism Social Skills Profile?*

5. *What is the correlation between the number of "Power Charges" obtained on a self-recording instrument assessing different specific social skills, the number of*

Scooter Cards, and the number of Black Hole cards participants earn with the percentage of social interactions displayed during the analog free play period?

6. What is the improvement in following group rules during the social skills training sessions, as indicated by comparing the average number of Scooter and Black Hole cards earned during each session from ASD and typically developing participants?

7. What is the consumer satisfaction of Superheroes Social Skills for Children with Autism, as reported by parents and teachers on the Behavior Intervention Rating Scale?

8. What is the social validity of Superheroes Social Skills for Children with Autism, as measured by teacher and parent report on an adapted social validity scale (Bellini, 2007)?

9. What is the consumer satisfaction of Superheroes Social Skills for Children with Autism, as reported by both ASD and typical peer study participants on a study-derived Child Consumer Satisfaction Scale?

CHAPTER 2

METHODS

Participants

Participants were selected from an elementary school within a suburban school district outside of Salt Lake City, Utah. Study participants included 4 students with ASD as well as 4 typically developing students who also participated in the social skills training program, serving the role of "peer buddy" to the children on the spectrum. All participants were in the second through the fourth grade and were between the ages of 7 and 9. The students with ASD were educationally classified as having a disability under the Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 and received special education services during the study. These children were getting psychological services, specifically inclusion in a social skills group, as outlined on their Individual Education Plans (IEPs). They were also identified, either educationally or clinically, as having an ASD. Most of the students with ASD had prior experience participating in social skills training; however, none had exposure to the social skills training program being investigated.

Students in the typical peer group had not been categorized as having any kind of disability. Teachers nominated typical peers they believed would benefit from participation in the social skills group, would not experience any adverse effects from

missing some of the general education instruction by being included, and who would also be helpful to the program (i.e., successfully assist the students with ASD).

Inclusion Criteria

To participate in the social skills training intervention, students with an ASD had to meet the following inclusion criteria:

1) Have an IDEIA educational classification of autism and/or a clinical diagnosis of Autistic Disorder (High Functioning), Asperger's Syndrome, or Pervasive Developmental Disorder-Not Otherwise Specified from a qualified clinician (i.e., MD or licensed psychologist). For a medical diagnosis, the participant had to meet diagnostic criteria for the above disorders as outlined by APA (2000). (See Appendix B for an outline of the educational and clinical criteria used in this study.)
2) Meet or exceed the cut off score for an autism spectrum disorder on the Autism Diagnostic Observation Schedule-Generic (ADOS-G) (Lord et al., 2000).
3) Obtain a score on the Gilliam Asperger's Disorder Scale (GADS) (Gilliam, 2001) that showed the likelihood of Asperger's Disorder or achieve a score on the SRS (Constantino et al., 2003) that met or exceeded the cut off for an autism spectrum disorder (*T*-score > 60). Detailed descriptions of these measures follows.
4) Obtain a verbal IQ score of 69 or above on a standardized measure of intelligence with adequate psychometric properties, administered within the past 3 years by a qualified examiner.

5) Possess and demonstrate the sufficient use of both receptive and expressive language abilities, as assessed by the principal investigator, so as to be able to participate successfully in the social skills group.
6) Attend the elementary school where the study took place.

In addition to the above criteria, parents of the children with ASD also completed a study-derived placement checklist (Appendix A). This screener was developed to assist with participant selection and included the following components:

1. Developmental level of the child,
2. Language abilities of the child,
3. Parent description of cognitive abilities,
4. Current diagnosis of an autism spectrum disorder,
5. Unusual behaviors that interfere with social functioning and interactions,
6. Motivational level,
7. Attention abilities,
8. Memory abilities,
9. Anxiety , and
10. Other factors as deemed important by the parents.

Individual characteristics of each ASD study participant are included below and are also summarized in Table 5.

Participant 1

Participant 1 was a 9.2 year-old Caucasian female in the third grade. Participant 1 had a prior educational classification of Autism and a clinical diagnosis of Attention Deficit- Hyperactivity Disorder (ADHD), which was given when she was in preschool by

Table 5. Participant Characteristics

	Participant 1	Participant 2	Participant 3	Participant 4	Total Mean
Child's Age	9.2	8.10	9.6	8.2	8.8
ADOS Total Score	8	8	13	17	11.5
IQ Scores					
FSIQ	90	80	123	76	92.25
Verbal IQ	93	87	126	69	93.75
Nonverbal IQ	104	86	112	100	100.5
GADS Total Score					
Parent	120	67	82	75	86
Reg Ed Teacher	122	82	100	78	95.5
SRS Total Score (Pre-intervention)					
Parent	112	62	76	68	79.5
Reg Ed Teacher	87	67	64	51	67.25

a licensed psychologist. Participant 1 took medication for her ADHD. During the time of the study, Participant 1's parents were exploring applying for funding so that they could get their daughter medically evaluated for Asperger's Syndrome. Educationally, Participant 1 received academic services in the resource room of her elementary school, as well as psychological services.

Participant 1 used verbally fluent language abilities at the time of the study. A private licensed psychologist and the principal investigator administered Module 3 of the Autism Diagnostic Observation Schedule (ADOS) to confirm a diagnosis of an autism

spectrum disorder. Participant 1 obtained a score of 2 on the Communication domain and a score of 6 on the Social Interaction domain. The total score of 8 exceeded the autism spectrum cut off score of 7. Previously, Participant 1 had achieved a Full Scale IQ score of 90 on the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV), which put her overall cognitive abilities in the average range. Participant 1's Verbal Comprehension Index (VCI) and Perceptual Reasoning Index (PRI) scores both fell within average ranges, at standard scores of 93 and 104, respectively. On the parent version of the GADS, Participant 1 obtained a standard score of 120, which indicated a "high" probability of Asperger's Disorder. Similarly, on the teacher GADS, Participant 1 achieved a standard score of 122, which also indicated a "high" probability of Asperger's Disorder. On the parent version of the SRS, Participant 1 obtained a total score (T=112) that fell in the "severe" range, as was consistent with children that have clinical diagnoses of Autistic Disorder, Asperger's Disorder, or more severe cases of Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS). Although significantly lower, the teacher's ratings on the SRS resulted in a total score (T=87) that also fell in the "severe" range. Children with ASD typically achieve *t*-scores above 60 on the SRS (Constantino, et al., 2003).

On the placement checklist, Participant 1's mother stated that she has an unusually intense interest in the Loch Ness Monster and Scotland, which interferes with her social interactions with others. In fact, family vacations were planned around these interests. Self-injurious behavior included occasional skin picking. Participant 1 was described as being extremely active and distressed by new situations or people, or changes in routine.

Participant 2

Participant 2 was an 8.10 year-old Caucasian male in the third grade. Participant 2 had a prior educational classification of Autism and a medical diagnosis of congenital motor nystagmus. Educationally, Participant 2 received academic services in the resource room, speech and language services, as well as psychological services.

Participant 2 used complex phrase speech at the time of the study, although it did take him an extended amount of time to produce speech and communicate ideas. A licensed psychologist previously administered Module 2 of the ADOS to confirm the presence of an autism spectrum disorder. Participant 2 had obtained a Communication + Social Interaction Total score of 8, which exceeded the autism spectrum cut off score of 7. Previously, Participant 2 had achieved a Full Scale IQ score of 80, PRI score of 86, and VCI score of 87 on the WISC-IV, which put his overall cognitive abilities in the low average range. On the parent GADS, Participant 2 obtained a standard score of 67, which showed a "low" probability of Asperger's Disorder. Conversely, on the teacher version of the GADS, Participant 2 achieved a standard score of 82, which indicated a "high" probability of Asperger's Disorder. However, on both the parent (T=62) and teacher (T=67) versions of the SRS, Participant 2 obtained total scores that fell in the "mild to moderate" range, or similar to children with mild or "high functioning" autism spectrum conditions (Constantino et al., 2003).

Participant 2's mother commented on the placement checklist that, "He has a hard time communicating quickly and is a bit odd in his behavior… he isn't good at most sports that others engage in." She also explained that frustrating activities cause him to become upset but overall, "He's a pretty agreeable guy."

Participant 3

Participant 3 was a 9.6 year-old Caucasian male in the fourth grade. Participant 3 had a prior educational classification of Autism. He also carried clinical diagnoses of Asperger's Disorder, Sensory Integration Disorder, and Tourette's Syndrome, which were given by a developmental pediatrician who specializes in treating children with ASD. Educationally, Participant 3 received work completion services in the resource room as well as psychological services.

Participant 3's language abilities were verbally fluent at the time of the study. A licensed psychologist previously administered Module 3 of the ADOS to confirm the diagnosis of an autism spectrum disorder. Participant 3 had obtained a Communication + Social Interaction Total score of 13, which exceeded the autism spectrum cut off score of 7. Previously, Participant 3 had achieved a Full Scale IQ score of 123, PRI score of 112, and VCI score of 126 on the WISC-IV, which put his overall cognitive abilities in the superior range. According to the ratings obtained on the parent version of the GADS, Participant 3 obtained a standard score of 82, which indicated a "high" probability of Asperger's Disorder. The teacher version of the GADS had similar results (*SS*=100), also showing a "high" probability of Asperger's Disorder. Additionally, on both the parent (*T*=76) and teacher (*T*=64) versions of the SRS, Participant 3 obtained total scores that fell in the range typical of children on the autism spectrum.

On the placement checklist, Participant 3's parents stated that new situations and people, changes in routine without notice, and frustrating activities cause him to become upset. They elaborated that both hunger and sensory sensitivities appear to be a trigger to meltdowns at school.

Participant 4

Participant 4 was an 8.2 year-old Caucasian male in the second grade. Participant 4 had a prior educational classification of Other Health Impairments, which was changed to Autism by his special education team during the study. He also a carried clinical diagnosis of PDD-NOS, which was given by a developmental pediatrician specializing in treating children with ASD. Participant 4 was also medically diagnosed with Fragile X, as reported by his mother. Educationally, Participant 4 received blended services in a functional skills class and his regular second grade education classroom, as well as psychological services.

Participant 4's language abilities were verbally fluent at the time of the study. The principal investigator administered Module 3 of the ADOS to confirm the diagnosis of an autism spectrum disorder. Participant 3 obtained a Communication score of 6 and a Reciprocal Social Interaction score of 11 on the ADOS, resulting in a total score that exceeded the autism spectrum cut off score of 7. Participant 4 obtained a Full Scale IQ score of 76, PRI score of 100, and VCI score of 69 on the WISC-IV, which put his overall cognitive abilities in the borderline range. Participant 4 obtained a standard score of 75 on the parent version of the GADS, which indicated a "borderline" probability of Asperger's Disorder. The general education teacher version of the GADS had similar results (*SS*=78), also showing a "borderline" probability of Asperger's Disorder. However, the Functional Skills teacher also completed the GADS as part of a prior special education evaluation. Her ratings resulted in a standard score of 97, which indicated a "high" probability of Asperger's Disorder. Additionally, on the parent (*T*=68)

but not the teacher (*T*=51) versions of the SRS, Participant 4 obtained a total score that fell in the range typical of children on the autism spectrum.

Participant 4's parents did not ever return the placement checklist, so information was garnered from his teachers. They reported that Participant 4 struggles with social interactions often playing by himself on the playground. His Functional Skills teacher stated that during play activities he often "thinks only of himself" and "has his own agenda." She stated that at times he could be physically aggressive, citing examples of when he hit others when frustrated during a physical education period or at recess.

Setting

The Superheroes Social Skills for Children with Autism intervention was implemented in an office located at the elementary school. The office contained an area of free space, approximately about 8 feet by 5 feet, where participants sat on carpet squares during instruction and while watching the videos. This same space was where the students conducted their role plays, engaged in social games relevant to the skill being targeted, and had their analog free play period. Social games were incorporated into the social skills curriculum as instructional practice. For example, a game referred to as "Scooter Says," was included in the Following Directions lesson. Additionally, six solitary and interactive games were available for the participants to use during the analog free play period, which occurred once a week directly following the second session of each lesson. These games included Don't Break the Ice (Hasbro), Jenga (Parker Brothers), and Ants in the Pants Spongebob Squarepants Edition (Hasbro). Additionally, the children had access to toy cars with a track (Mattel), Legos (LEGO), and Transformers (Hasbro).

There was a portable easel with a white board to write the daily schedule and a bulletin board attached to a wall, which listed the group rules and was where the social skills materials were posted (e.g., Group Rules and Power Posters). There was also a video camera and tripod used to record the analog free play observations, as well as a computer situated on a desk that played the social skills DVD lessons.

Measures

Diagnostic

Autism Specific

Autism Diagnostic Observation Schedule-Generic (ADOS-G)

The ADOS-G (Lord et al., 2000) is a semistructured, standardized assessment tool designed to evaluate individuals of all ages who are suspected of having an autism spectrum disorder. During administration, 1 of 4 modules is chosen dependent on the person's chronological age and expressive language ability, ranging from the absence of speech to the presence of verbally fluent communicative abilities. Each module contains activities intended to probe for various types of social behavior, verbal and nonverbal forms of communication, inappropriate or stereotyped behaviors, and imagination and play skills, all of which map onto current diagnostic criteria (DSM-IV-TR, 2000).

At the end of the ADOS-G administration, which typically lasts under 45 minutes, the examiner codes the individual's behavior during the session using a 3-point scale. The results of these ratings derive three algorithms: a total score, a score for reciprocal social interaction, and a score for communication. These algorithms dictate whether the individual meets the threshold for either autism or a PDD-NOS, the latter of which

requires less severe social and communicative impairments demonstrated during the administration.

Research on the ADOS-G has shown excellent interrater reliability for individual items and within scales, good test-retest reliability for particular items, and adequate internal consistency (Lord et al., 2000). Additionally, the ADOS-G demonstrated good discriminant validity in distinguishing individuals on the autism spectrum from those not. However, the ADOS-G is not as successful in differentiating individuals presenting with various severities of autistic characteristics, such as those meeting clinical criteria for either autism or PDD-NOS (Lord et al., 2000). Clearly, the ADOS-S is best used to make distinctions between those who have and do not have an autism spectrum disorder. The ADOS was used as the primary indicator to confirm the participants' diagnosis of an autism spectrum disorder.

Gilliam Asperger's Disorder Scale (GADS)

The GADS (Gilliam, 2001), along with the ADOS, was also used in this study to confirm the presence of an ASD in individual participants. The GADS can be completed by parents or other professionals such as teachers and takes between 5 and 10 minutes to administer. The 32 item norm-referenced checklist was designed to be used with individuals between the ages of 3 and 22. An overall composite score, termed the Asperger's Disorder Quotient (ADQ), delineates the likelihood that the person meets current criteria for ASD and discriminates between individuals who have autism and other behavioral disorders. The manual contains standard scores and corresponding percentiles. There are also four subscale scores derived based on respondent ratings of

frequencies of behavior, including Social Interaction, Restricted Patterns of Behavior, Cognitive Patterns, and Pragmatic Skills.

The normative sample of the GADS was conducted with 371 individuals diagnosed with ASD and taken from 46 states across the United States, as well as from the District of Columbia and Australia. Research has shown that compared to other similar instruments, the GADS has a large standardization sample and fair psychometric properties (Campbell, 2005).

Dependent Measures

Behavioral Rating Scales

Social Responsiveness Scale (SRS)

The SRS (Constantino et al., 2003) contains 65 questions that assess the severity of autistic symptoms quantitatively in several areas including social awareness, social information processing, reciprocal social communication, social anxiety or avoidance, and autistic traits and preoccupations. There are published parent and teacher versions, both of which can be completed in approximately 20 minutes. Designed to assist with diagnostic decisions and measure response to intervention over time (i.e., treatment effects), the SRS is appropriate to be used with children between 4 and 18 years of age. The SRS is helpful in identifying individuals who have Autistic Disorder, Asperger's Disorder, and PDD-NOS.

The SRS uses a 4-point Likert scale. Raters read various statements and indicate whether the items are "not true," "sometimes true," "often true," or "almost always true" regarding the child being evaluated. Some of the statements are reverse-scored. Ratings result in a single total score and five treatment subscales: Social Awareness, Social

Cognition, Social Communication, Social Motivation, and Autistic Mannerisms. Each treatment subscale represents a unique aspect of social behavior (see Table 6). Raw scores are converted into *t*-scores. *T*-scores of 76 or higher are considered severe, are commonly associated with individuals who have been diagnosed with Autistic Disorder or Asperger's Disorder, and generally provide compelling evidence of an autism spectrum disorder. *T*-scores between 60 and 75 fall in the mild to moderate range. These scores are usually obtained by individuals who have a clinical diagnosis of "high functioning" autism or PDD-NOS. *T*-scores of 59 or less reflect the normal range (Constantino et al., 2003).

The SRS has shown excellent psychometric properties. Calculated interrater reliability coefficients were 0.8 and it was demonstrated to correlate well with the Autism Diagnostic Interview-Revised (ADI-R) (Constantino et al., 2003). Thus, the SRS is a valid measure used to assess the existence and degree of autistic characteristics presented by an individual.

The Autism Social Skills Profile (ASSP)

The ASSP is an unpublished rating scale that can be used with children and adolescents with ASD between the ages of 6 and 18 (Appendix D). It was developed to evaluate social functioning and social types of behaviors, including initiation skills, social reciprocity, perspective taking, and nonverbal communication. Parents, teachers, and other adults familiar with the youth being assessed complete the ASSP (Bellini & Hopf, 2007). In fact, its original use was to identify social skills deficits in children with ASD prior to the onset of a social skills training program. Administration time is between 15 and 20 minutes. It was specifically designed to assess small changes in functioning due

Table 6. Description of SRS Treatment Subscales

Social Awareness	Ability to pick up on social cues, represent sensory aspects of reciprocal social behavior
Social Cognition	Ability to interpret social cues once they are picked up; represents cognitive-interpretive aspects of reciprocal social behavior
Social Communication	Includes expressive social communication; represents the "motoric" aspects of reciprocal social behavior
Social Motivation	Extent to which a respondent is generally motivated to engage in social-interpersonal behavior; includes elements of social anxiety, inhibition and empathic orientation
Autistic Mannerisms	Includes stereotypical behaviors or highly restricted interests characteristic of autism

to intervention effects, address social behavioral competencies and deficiencies specific to ASD populations, and to aid in intervention development and monitoring as opposed to being a diagnostic tool (Bellini & Hopf, 2007).

The ASSP uses a 4-point Likert scale, requiring respondents to determine whether the child or student exhibits behaviors and skills on a continuum from "never" to "very often." Most of the statements are worded positively, but a few at the end of the questionnaire are stated negatively, and are subsequently reverse-scored. Completion of the ASSP results in a total score of social functioning and three subscales: Social Reciprocity, Social Participation/Avoidance, and Detrimental Social Behaviors. Factor

analysis demonstrated that each subscale differentiates social functioning, with Social Reciprocity being the primary dimension (Bellini & Hopf, 2007) (see Table 7). Higher scores reflect better social functioning. In the normative sample, the mean score for the high functioning group (i.e., subjects did not carry diagnoses of an intellectual disability and/or severe expressive language deficit) was 109.83, with a range of scores from 70 to 177. Initial investigation of the psychometric properties of the ASSP showed excellent internal consistency, test-retest reliability, and concurrent validity (Bellini & Hopf, 2007).

The SRS and ASSP were completed both prior to and at the completion of the social skills training by parents and teachers, namely, to measure the effectiveness of the intervention. Instruments were administered as deemed appropriate based on the students' age and ability level. The principal investigator scored all of the protocols.

Observational System

An observational system developed by Bellini (2007) was adopted for the current study. The system was based on the conceptualization that unprompted social engagement with peers is operationally defined as incorporating both social initiations and social responses of the participants. This method uses a partial interval time-sampling recording system based on 10-second increments, with the first 5 seconds to observe the behavior and another 5 seconds to record either a social initiation or social response code, whichever occurs first (see Appendix E for specific code definitions). If the targeted child does not exhibit a social initiation or social response during the first half of the interval, then the code is recorded as no social engagement. Essentially, social initiations include requesting assistance or information from others; requesting

Table 7. Description of ASSP Subscales

Social Reciprocity	Active maintenance of social interactions and the demonstration of perspective-taking skills
Social Participation/Avoidance	Social engagement or withdrawal from social participation
Detrimental Social Behaviors	Socially inappropriate behaviors that could lead directly to negative peer interactions

interaction or participation; joining a play activity or interaction; giving a greeting or compliment; and showing, sharing, or giving an object. Responding to a request for assistance or information; joining an activity when asked; accepting an object when offered; and appropriately continuing a social interaction, comprise social responses.

Observations were made during an analog free play period in the social skills training group (i.e., directly at the end of the lesson), as well as during a naturalistic setting (i.e., recess). In the free play setting, participants were consistently able to choose from the same set of toys throughout the study. Both solitary and interactive toys were used. During recess, the participants had the opportunity to play either by themselves or with peers on various playground structures, on the field, by the ball wall, or around a track.

Indicators of Social Validity

Treatment Acceptability and Effectiveness

Behavior Intervention Rating Scale (BIRS)

The BIRS is a valid measure of treatment acceptability and perception of treatment effectiveness (Elliott & Treuting, 1991), and adequately differentiates between the two constructs (von Brock & Elliott, 1987). Research illustrates that the two constructs are correlated and a teacher's view of treatment acceptability can impact their judgments of treatment effectiveness (von Brock & Elliott, 1987).

The published scale can be administered to both teachers and parents. It contains 24 questions that are answered based on a 6-point Likert scale system which target issues such as whether the adult would recommend the intervention or if the intervention significantly altered the child's behavior. Higher numbers represent a greater degree of agreement with the statements. Answers are tabulated, resulting in an overall score for both acceptability and effectiveness. In the current study, the BIRS was given to both parents and teachers upon completion of the social skills training intervention.

Social Validity Scale/Child Consumer Satisfaction Questionnaire

A scale of social validity, developed for research (Bellini, 2007), was adapted and utilized in the current study to assess how teachers and parents perceived the intervention. The scale investigates whether the intervention disrupted normal classroom activity, was distracting, was easy to implement, the degree of student enjoyment and benefit, as well as other pertinent factors. The Child Consumer Satisfaction Survey is a study-derived child version of the social validity scale. Questions address whether students viewed the

video intervention and/or participated in the social skills training (see Appendices F and G for specific examples of these scales).

Treatment Integrity

A treatment integrity checklist was created to ensure that the social skills training program was implemented as intended (see Appendix H). On this list were detailed and sequential steps to each specific component of a lesson. After each session, the principal investigator independently completed the checklist, marking off each step she followed during the training session. Throughout the study, an independent graduate student observer verified the accuracy of the facilitator's ratings on the integrity checklist by completing her own checklist. At the end of the study, the mean percentage of treatment integrity was then computed.

Behavioral Markers

During the social skills training sessions, Scooter cards were distributed when participants were following the group rules: Get Ready, Follow Directions, Be Cool, and Participate. Conversely, Black Hole cards were given for noncompliance to these rules. These cards were kept and recorded as indicators of behavioral functioning and compliance throughout the training. Additionally, Power Charges obtained on a participant's Power Card (i.e., for demonstrating a particular social skill) were noted and monitored.

Procedure

The Superheroes Social Skills for Children with Autism program was implemented after approval was obtained from the Institutional Review Board (IRB) for

the Protection of Human Subjects, as well as the school district's own internal research review committee through the Research and Assessment Department. Once approval had been granted from both of these institutions, informed consent was acquired from the children's parents and/or legal guardians prior to participation in the study. Informed assent was also collected from the children themselves, when applicable (see Appendix C for IRB forms).

All participants and their families were treated with the ethical standards as put forth by the American Psychological Association (2002). Initially, the parents or guardians of the students with ASD who met eligibility requirements were contacted either by phone, in person, or by letter by the principal investigator. The purpose of the social skills training program was explained and any questions or concerns were addressed at that time. After consent was obtained from those families willing to participate, the student's teacher was notified. The teachers were asked to nominate a peer without ASD in the child's class who would participate in the social skills training program as well, serving as a "peer buddy" to assist the students with ASD. Consent was also attained from the parents of these typically developing students. Again, the program was outlined and questions were answered. Training was provided to parents, teachers, and typical peers prior to the start of the intervention phase.

The social skills training sessions occurred twice per week, occurring at the end of the school day. In this study, 11 of the 17 critical skills included in the overall Superheroes Social Skills for Children with Autism program, including all of the foundational and intermediate skills, were taught over a period of 11 weeks. Participants were also exposed to the Introduction to the Group lesson at the beginning of the

intervention. Sessions lasted approximately 30 minutes. Two graduate students helped implement the intervention. Specifically, they each attended one session per week and helped the principal investigator facilitate the groups by handing out Scooter and Black Holes cards, helping transfer Power Charges onto Power Posters, and assisting with the role plays and filming of the analog free play periods. Students were taken from their general education classes to participate. Vigorous attempts were made to take students at times when they would be least likely to miss valuable academic instruction. The students in special education did not miss other IEP mandated services such as time in the resource room or with the speech and language pathologist or occupational therapist.

The 10-minute observations occurred during baseline, intervention, and follow-up phases of the study. The treatment phase lasted 11 weeks. There was a 2-week wait period between the end of the intervention phase and the beginning of the follow-up phase (to assess treatment maintenance effects). There were four observations taken during the analog free play period for the baseline phase, and all 4 participants were present. There were four observations conducted for Participant 1 and Participant 2 during the baseline recess phase, and three observations taken for Participants 3 and 4 during the baseline recess phase.

The analog free play sessions occurred once weekly, directly following the second part or day of the week that the social skills lesson was being taught. Essentially, there were 11 analog free play observations taken during the intervention phase of the study. Participant 2 was present for all 11 of these observations. Participant 1 attended 10 of these observations, while Participant 3 and Participant 4 were present for 9 of the 11

analog free play observations during the intervention phase of the study. Absences were due to illness on the day the analog free play observations occurred.

The participants had different recess periods depending on their grade level. Originally, it was decided that a random number table would determine which student was observed each week, with observations conducted every other week for each participant. However, there was a lot of variability in recess time each week, depending on whether students had to stay in to complete work, were absent during the day they were supposed to be observed, or missed recess due to other unforeseen factors. Thus, it was not always possible to obtain recess observations every other week for each participant, although vigorous attempts were made to do so when feasible. During the intervention phase, six recess observations were collected for each participant.

After the 2-week follow-up period, observations were again made during both an analog free play period and during recess. Four observations were obtained for Participants 2, 3, and 4 during the follow-up analog free play. Participant 1 was out sick for several days and missed the first two of the four follow-up analog free play sessions. Subsequently, only two follow-up analog free play observations were acquired. For the follow-up recess period, two observations were collected for Participants 1, 2, and 3, while three observations were obtained for Participant 4.

Overall, Participants 1 and 3 were present for 28 observations. Twenty-nine observations were collected for Participant 4. Participant 2 had 31 observations. All 116 observations were videotaped and coded. The principal investigator coded the majority of the observations. A graduate student in the Educational Psychology Department independently coded 31 observations, which was a little over 25% of all the observations.

These were chosen at random to represent observations collected across the duration of the study. Of the observations the graduate student coded, 21 observations were also compared with those the principal investigator had coded in order to provide a measure of the reliability of the ratings. Essentially, just over 15% of the total observations were used to establish reliability.

The Sattler agreement/disagreement procedure was used to determine overall reliability. According to Sattler (2002), agreement at 80% or above is considered satisfactory. An interrater reliability analysis using the Kappa statistic was also performed to determine consistency among raters. Kappa provides a more accurate measurement of interrater reliability because it accounts for chance agreements (Chafouleas, Riley-Tillman & Sugai, 2007), as it uses the proportion of observer agreements and examines both occurrences and nonoccurrences of behavior (Sattler, 2006). Kappa was computed using the formula presented by Uebersax (1982).

Social Skills Training Program

The comprehensive social skills training package was developed to be used with elementary-aged students with Asperger's Syndrome or high-functioning autism. The program, named *Superheroes Social Skills Program for Children with Autism,* (Jenson et al., 2011), is comprised of empirically-based strategies extracted from the extant literature and shown to be effective with children specifically on the autism spectrum. Components include nondisabled peer involvement, peer and self video modeling, and self-management techniques. Several generalization strategies are employed, including the public posting of demonstrated skills, self-recording of skills learned, parent and teacher reinforcement outside of the training setting, and homework elements such as a

social narrative in the form of a comic book and review of instructional practices by watching a video DVD at home. Proven behavior management methods are also incorporated into the program to encourage motivation and behavioral compliance. Additionally, the animated instructional format of the intervention, as opposed to an adult didactic approach, was created to foster the focus and attention of youth with autism spectrum disorders in an exciting and entertaining manner.

The program is 18 weeks in duration, and designed for two 30-minute sessions each week. A new skill is introduced each week by the animated superheroes (e.g. Initiator Man, Interactor Woman, and their side-kick dog, Scooter) progressing from foundational to intermediate to advanced types of social skills. Skill rationale, exceptions, and discrete steps are provided for each skill. Typical peer models are shown exhibiting the skill. With the assistance of an adult facilitator, the ASD children and their nondisabled peers are prompted via video DVD to model and rehearse the targeted skills and are provided with immediate reinforcement. Various social games, geared to elicit and provide an opportunity to practice the newly acquired skills, were also developed to be used in several of the sessions. (See Appendix I for an introduction to the program and sample of the initial lessons.)

Design

A replicated single-subject AB research design was used in this study to assess the effectiveness of the social skills training program by detecting changes in social engagement (as defined by Bellini, 2007) of 4 elementary-aged students with an autism spectrum disorder (Hayes, 1981). Four elementary-aged students without an ASD also participated in the program; however, changes in social engagement were not assessed

for these children. The purpose of including the non-ASD students was for them to participate in the intervention and act as "peer buddies" to the students with ASD. The study consisted of baseline, treatment, and follow-up phases for both analog free play and recess periods. Once stability occurred in the baseline phase (A), then the treatment phase of the study began (B).

Along with using a single-subject AB research design come various threats to internal validity, meaning that there may be other confounding factors impacting the results rather than the intervention itself. For example, some of these threats include history or maturation effects (Kratochwill, 1978). However, Kazdin (1982) and Kratochwill (1992) have purported that AB designs are valid when they abide by very specific conditions. Kazdin (1982) concluded that the following components lend validity to AB designs:

1. The data are objectively defined
2. Assessments occur on multiple occasions (i.e., repeated testing)
3. There is stability in the behavior being treated
4. The group being investigated is heterogeneous in composition
5. Immediate and marked effects occur as a result of the intervention

Additionally, Kratochwill (1992) included several other criteria that make AB research designs more robust:

1. The study must be planned
2. There must be a high degree of treatment integrity
3. The study must produce a large effect
4. Standardized treatment is used

The current study abided by most of Kazdin and Kratochwill's recommendations, as outlined above. The data taken during the study, such as the weekly observations, were operationally defined. Distinct changes in the participants' percentage of social engagement interactions during analog free play and recess periods were investigated. The participants' social engagement skills, including both social initiations and responses, were stable. The study was outlined prior to implementation and employed a standardized treatment. Treatment integrity, social validity, maintenance, and generalization factors were incorporated. Results were instant as well as substantial.

According to Hayes (1981), if there is stability in the trend in baseline, and then significant changes occur in the trend during treatment, it is likely that the intervention is responsible for the changes that occurred. However, many researchers using single-subject designs opt to employ multiple baseline (i.e., staggering the baseline phases at different increments for each participant) or ABAB designs in the attempt to control for threats to both internal and external validity. However, in the current study, it was not feasible to use a multiple baseline design because the intervention involved using a group of participants who all commenced the intervention at the same time.

Data Analyses

Treatment effectiveness for the students with ASD was evaluated through the calculation of effect sizes (ES) and PND. These were computed by establishing the percentage of intervals in which the participant with ASD was involved in appropriate initiations and responses during baseline, treatment, and follow-up phases, for both the analog free play and recess periods.

An effect size measures the magnitude of the observed effect of the treatment being tested. In this study, it is the standardized mean difference between the baseline and treatment phases as measured by standard deviation units. The Busk and Serlin model (1992) was used to derive effect sizes. The formula used was as follows:

$$d = \frac{\overline{x}_2 - \overline{x}_1}{\sqrt{(SD_1^2 + SD_2^2) / 2}}$$

In the computations, the pooled standard deviation from baseline and treatment phases was used, in order to obtain more conservative results. Effect sizes were calculated by subtracting the baseline mean from the treatment mean and dividing this result by the pooled standard deviation. The pooled standard deviation was derived by obtaining the square root of the weighted average of the variances for baseline and treatment phases.

To calculate PND, the number of data points attained during the treatment phase that exceeded the highest data point achieved during the baseline phase was divided by the total number of data points obtained during the treatment phase (Scruggs, Mastropieri & Castro, 1987). Data derived from Bellini's (2007) social observational system was used in both types of analysis, specifically the percentage of intervals the participants made social initiations and social responses with peers. Overall social engagement, a combination of both social initiations and social responses, was also used.

Changes in scores were calculated for the overall composites and subscales of the Social Responsiveness Scale and Autism Social Skills Profile to assess pre- and postintervention effects. The adapted Social Validity Scale, Behavior Intervention Rating

Scale, and Child Consumer Satisfaction Survey, were also evaluated through descriptive statistics. The number of Scooter and Black hole cards were averaged by session for the ASD and non-ASD participant groups and compared over time through the plotting of acquisition curves.

CHAPTER 3

RESULTS

The purpose of this study was to test a social skills program called Superheroes Social Skills for Children with Autism. This program was designed to teach social skills to elementary aged students with autism spectrum disorders and incorporates evidence-based techniques such as video modeling, social narratives, direct instruction, and self-monitoring in a multimedia format with Superheroes characters and fast hands animation.

Treatment Integrity

The Superheroes Social Skills program was implemented with 100% integrity, as measured by treatment fidelity checklists. These checklists were completed at the end of each social skills session by the principal investigator, as well as by an independent graduate student rater. Interpretation of the study's results can be made with confidence since the social skills program was implemented with fidelity and consistently applied.

Reliability

The overall interrater reliability was 95%, as measured by dividing the number of agreements by the total number of agreements and disagreements. In addition, the interrater reliability analysis for the two raters (i.e., the graduate student and the principal investigator who coded the observations) was found to be Kappa=0.877 ($p<0.001$), 95% CI (0.847-0.906). These statistics demonstrate that there was a very good strength of

agreement between the two raters. According to Landis and Koch (1977), a kappa above 0.81 has almost perfect concordance. Given these results, the observational codings employed in this study are likely to be reliable and interpretable.

Research Question #1

1. What is the overall effectiveness (e.g., effect size and percentage of nonoverlapping data points) of Superheroes Social Skills for Children with Autism, as measured by observational data taken during the analog free play period in the training setting? *(Measured by Bellini's (2007) social interaction observation system.)*

All Participants

All of the observations were 10 minutes in length. The study participants initiated social interactions with peers during the analog free play observation period an average of 7.0% of intervals during baseline, 7.75% of treatment intervals, and 8.5% of intervals during the follow-up period. Participants made social responses to other children in the group an average of 17.75% of intervals during baseline, 26.0% of intervals during treatment, and 25.75% of intervals during follow-up. Overall social engagement, on average, was 24.5% of baseline intervals, 34.0% of treatment intervals, and 34% of follow-up intervals. Figure 1 shows the mean percentage of social engagement by session during analog free play.

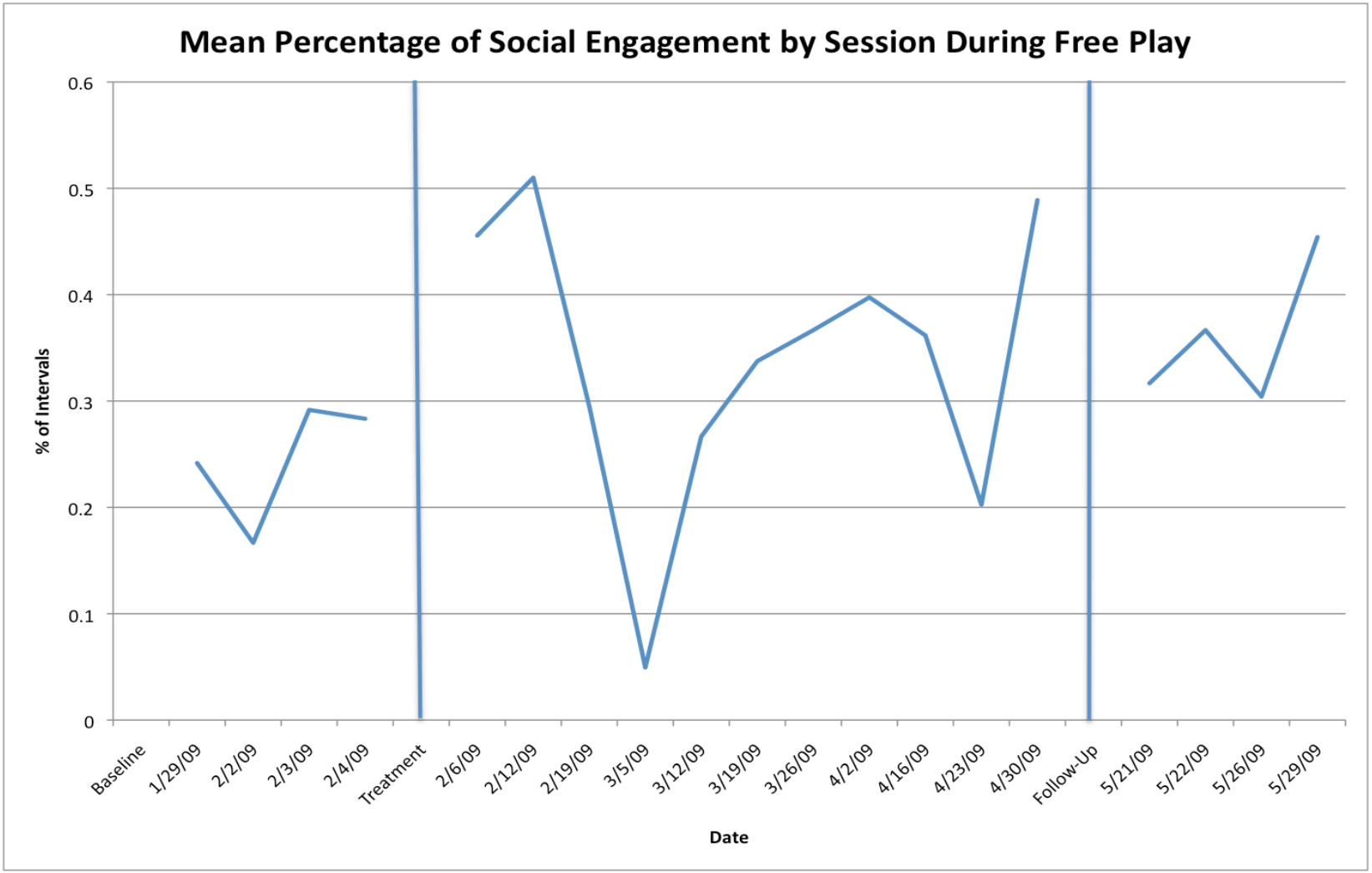

Figure 1. Mean Percentage of Social Engagement by Session During Free Play

Using the procedures and interpretation guidelines described by Scruggs et al. (1987), the PND in the areas of social initiations, social responses, and overall social engagement were calculated. A PND above 90% is considered to reflect a very effective treatment, whereas a PND above 70% equates an effective treatment. If the PND is between 50% and 70%, the treatment effectiveness is interpreted as being questionable. A PND below 50% suggests that there is no observed effect or the treatment is ineffective.

The average PND for all participants for social initiations was 39.09% between baseline and treatment phases and 37.50% between baseline and follow-up phases for the analog free play period. The PND, on average, for all participants for social responses was 29.24% between baseline and treatment periods and 37.50% between baseline and follow-up periods. These results indicate that there were no treatment effects for social initiations and responses between baseline and both treatment and follow-up phases. For the analog free play period, the overall PND for participants, on average, for social engagement was 50.4% between baseline and treatment phases, and 50% between baseline and follow-up phases, indicating questionable treatment effects.

Cohen's (1988) metric was utilized to interpret the average effect sizes for study participants. Using his suggestions, an effect of 0.80 or above is considered to be a large effect, between 0.50 and 0.79 is a moderate effect, and between 0.20 and 0.49 is a small effect. Average effect sizes were calculated between baseline and treatment periods for all four participants. One of the participants was only able to participate in two of the four follow-up analog free play observation sessions due to illness. The other 3 participants attended all four of the follow-up analog free play observations.

A small effect size (*ES*=0.39) on average for participants was found for social initiations during the analog free play period, reflecting the change between baseline and treatment periods. There was a moderate effect size on average for social responses (*ES*=0.72) and a large effect size for total social engagement (*ES*=0.85) between baseline and treatment phases. Between baseline and follow-up periods for the analog free play period, there was a small effect size (*ES*=0.36) on average for social initiations. There were moderate effects sizes on average for social responses (*ES*=0.73) and total social engagement (*ES*=0.74).

Participant 1

Participant 1 attended 18 of the 22 social skill sessions. Participant 1 was present for all four of the analog free play baseline observations, 10 of the 11 treatment observations, and 2 of the 4 follow-up observations. During the analog free play period, Participant 1 initiated social interactions with peers an average of 10% of baseline intervals, 9% of treatment intervals, and 8% of follow-up intervals (see Figure 2). Participant 1 made social responses to the other children in the group during an average of 12% of the baseline intervals, 21% of treatment intervals, and 10% of follow-up intervals (see Figure 3). Social engagement was noted in an average of 22% of the baseline intervals, 30% of treatment intervals, and 18% of follow-up intervals (see Figure 4).

The PND for Participant 1 for social initiations was calculated to be 20% between baseline and treatment periods and 0% between baseline and follow-up periods, for the analog free play period. For social responses, the PND was 20% between baseline and treatment phases, and 0% between baseline and follow-up phases. The PND for total

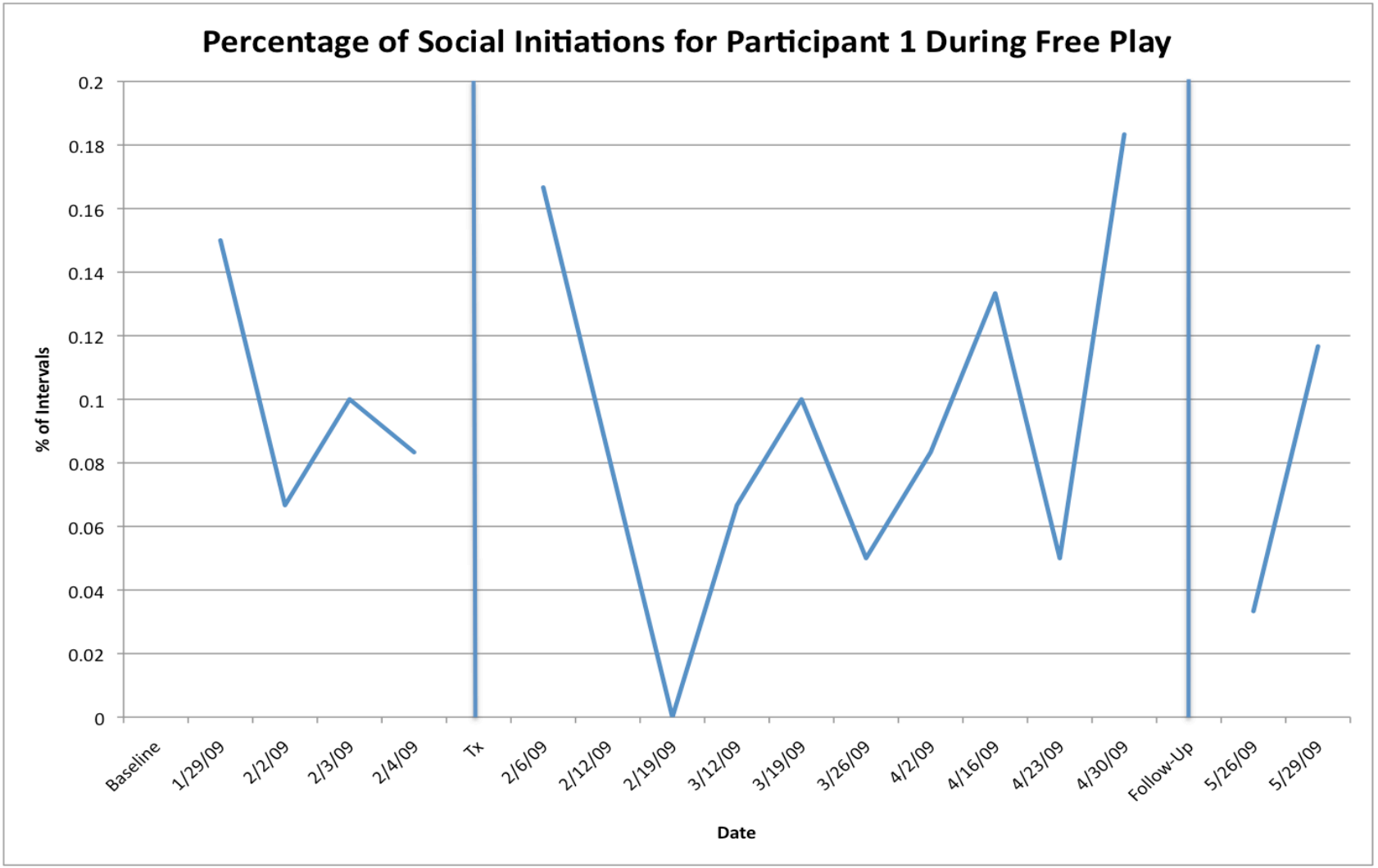

Figure 2. Percentage of Social Initiations for Participant 1 During Free Play

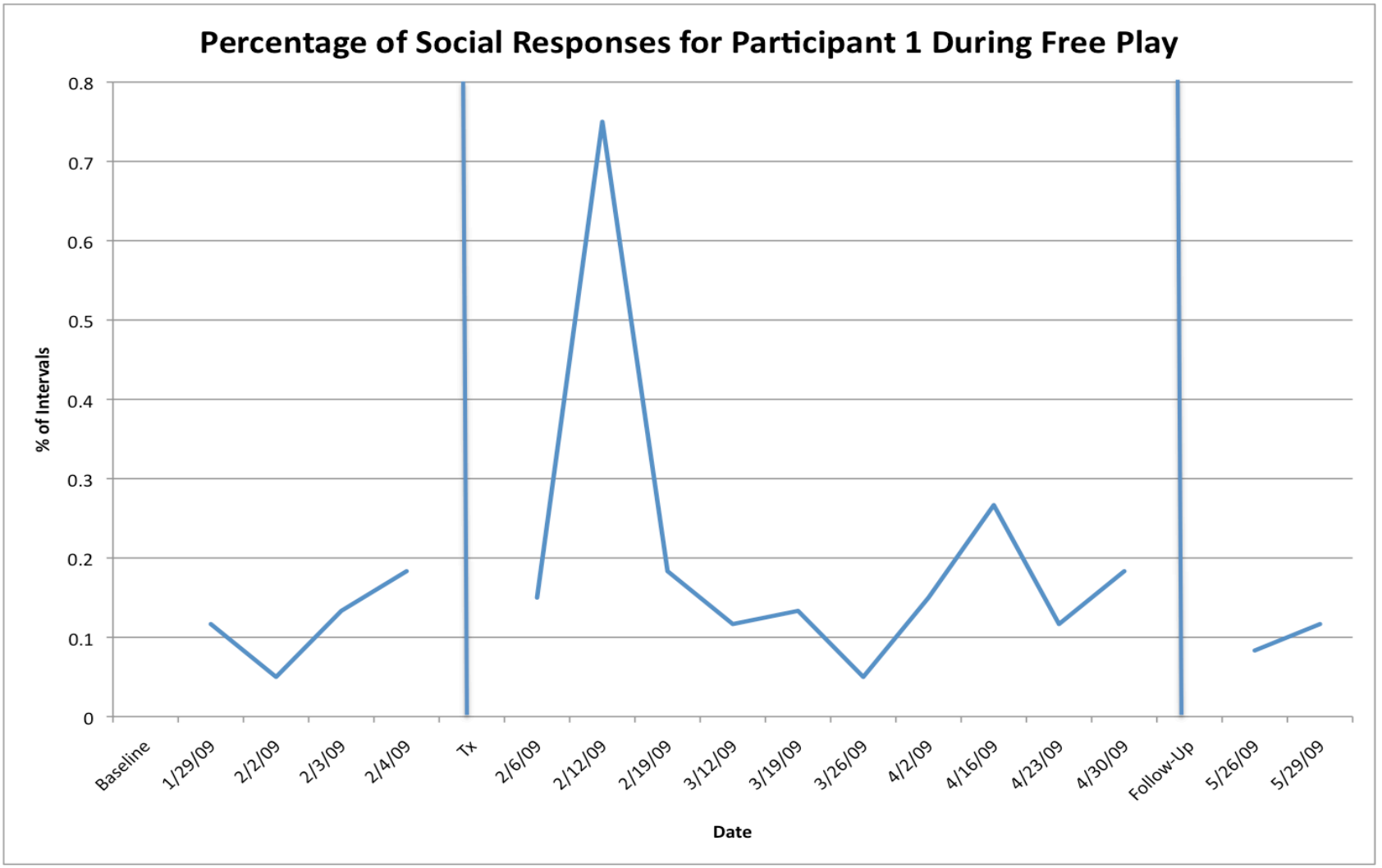

Figure 3. Percentage of Social Responses for Participant 1 During Free Play

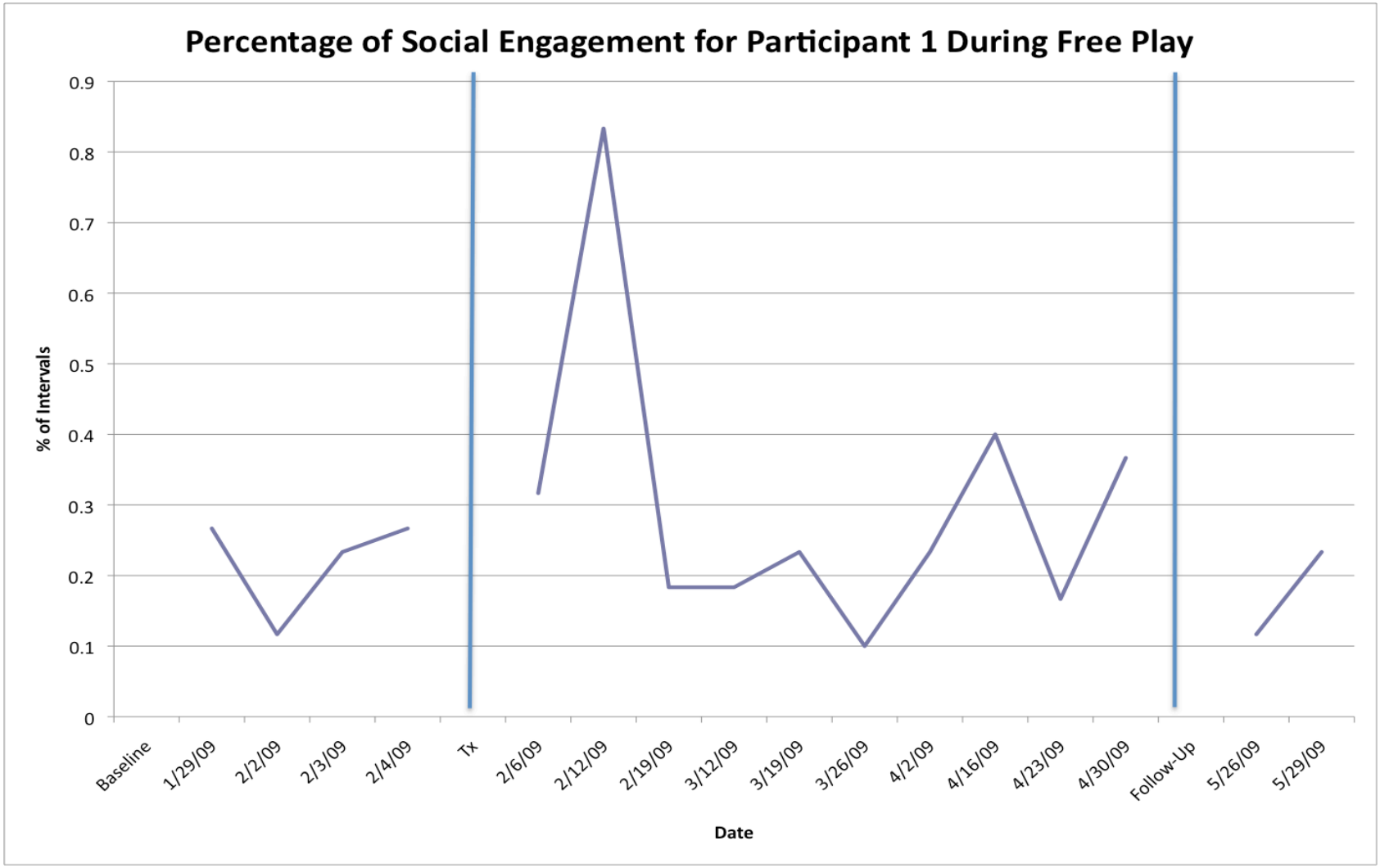

Figure 4. Percentage of Social Engagement for Participant 1 During Free Play

social engagement for the analog free play period was calculated to be 40% between baseline and treatment periods and 0% between baseline and follow-up periods. These results all indicate no treatment effects, based on the interpretation guidelines for PND.

The effect size for Participant 1 for analog free play between baseline and treatment phases for social initiations (*ES*=-0.16) indicated a slightly adverse effect. The effect sizes for social responses (*ES*=0.59) and total social engagement (*ES*=0.49) were moderate and small, respectively. During the analog free play period, the effect sizes between baseline and follow-up phases for social initiations (*ES*=-0.45), social responses (*ES*=-0.36), and total social engagement (*ES*=-0.50) all indicated negative effects.

Participant 2

Participant 2 attended all 22 social skill sessions. Participant 2 was present for all four of the baseline observations, 11 treatment observations, and four follow-up observations. Essentially, attendance rate was 100%. During the analog free play period, Participant 2 initiated social interactions with peers an average of 8% of baseline intervals, 10% of intervention intervals, and 16% of follow-up intervals (see Figure 5). Participant 2 made social responses to the other children in the group during an average of 20% of the baseline intervals, 33% of intervention intervals, and 30% of follow-up intervals (see Figure 6). Social engagement was noted in an average of 28% of the baseline intervals, 43% of intervention intervals, and 46% of follow-up intervals (see Figure 7).

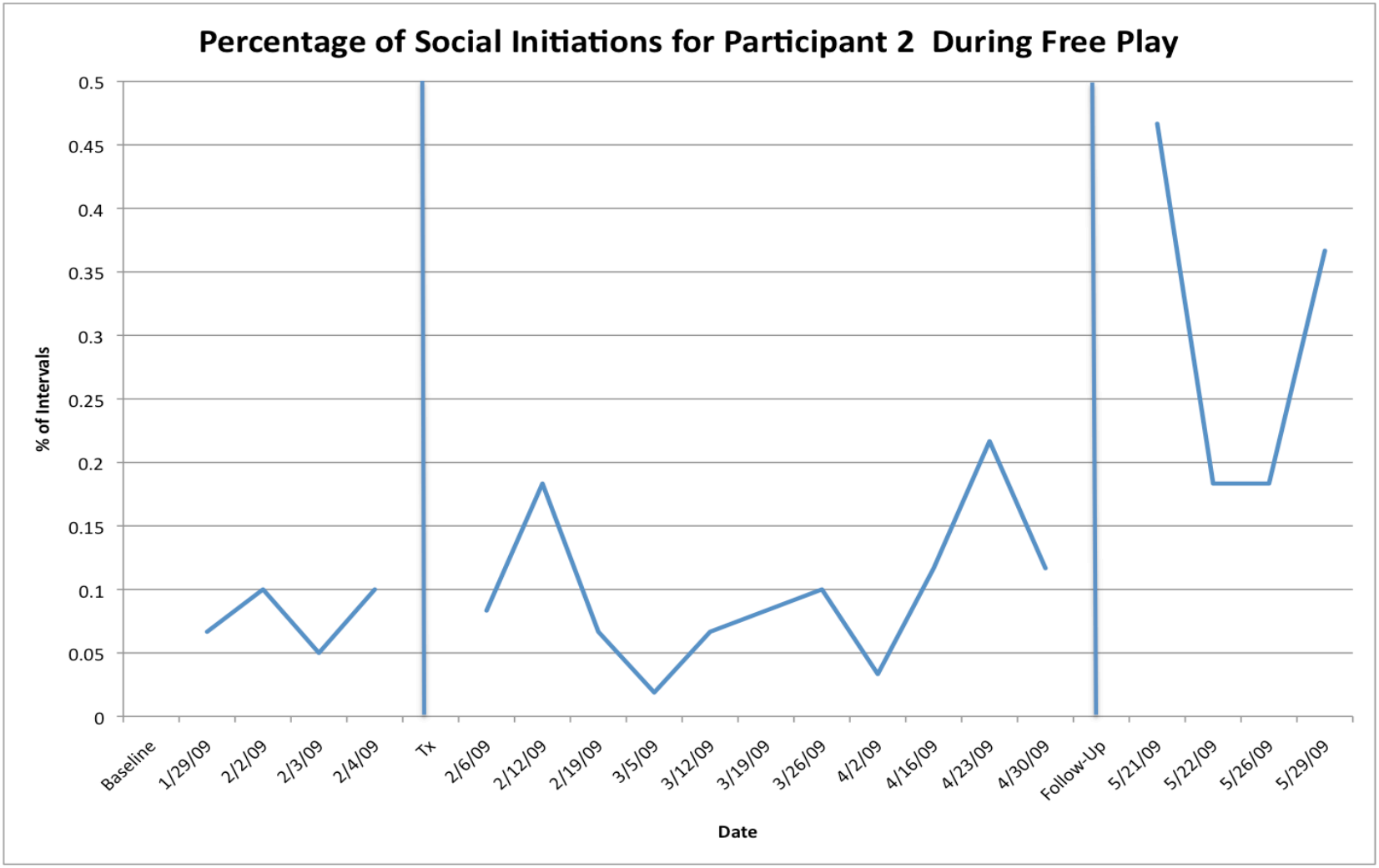

Figure 5. Percentage of Social Initiations for Participant 2 During Free Play

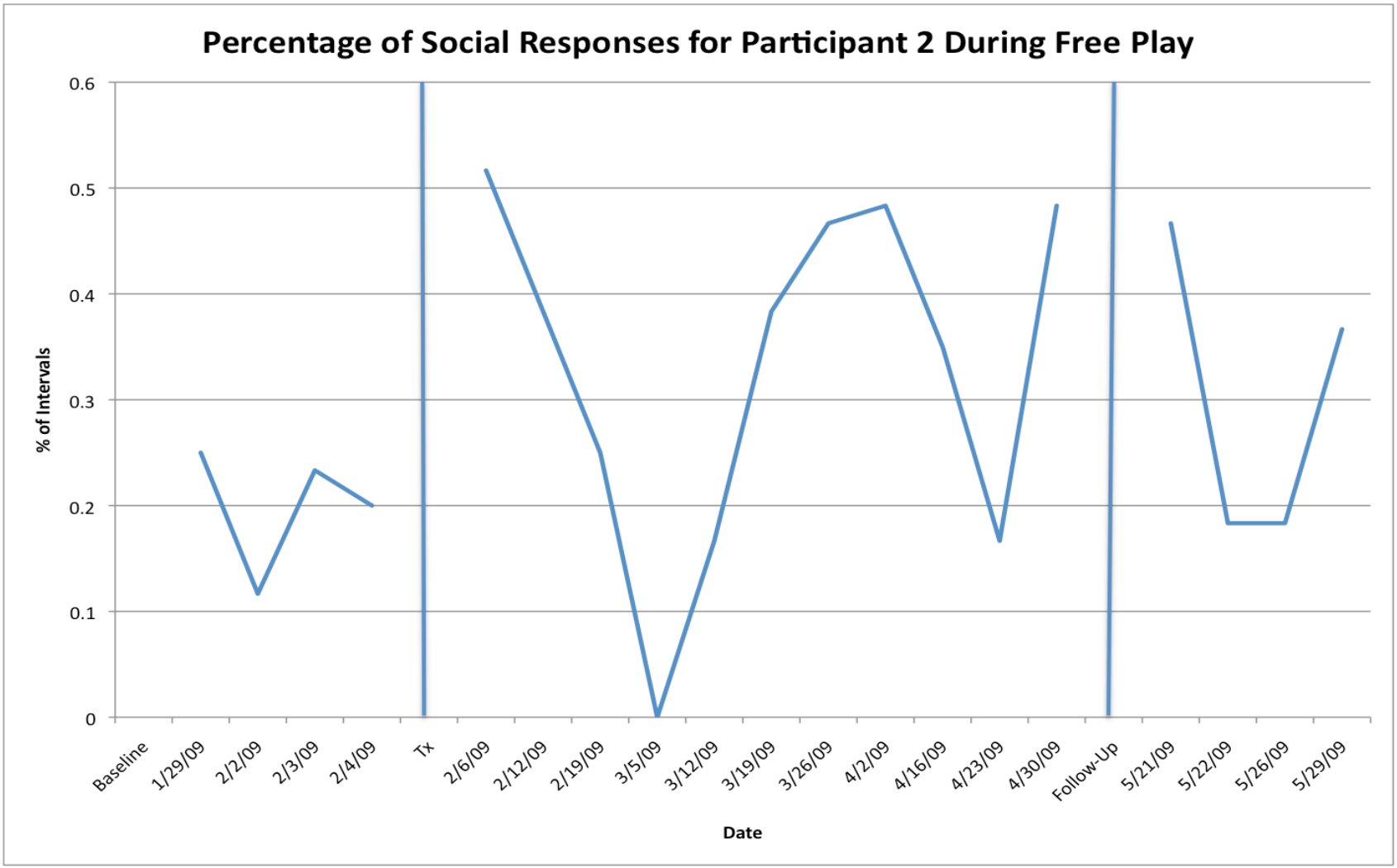

Figure 6. Percentage of Social Responses for Participant 2 During Free Play

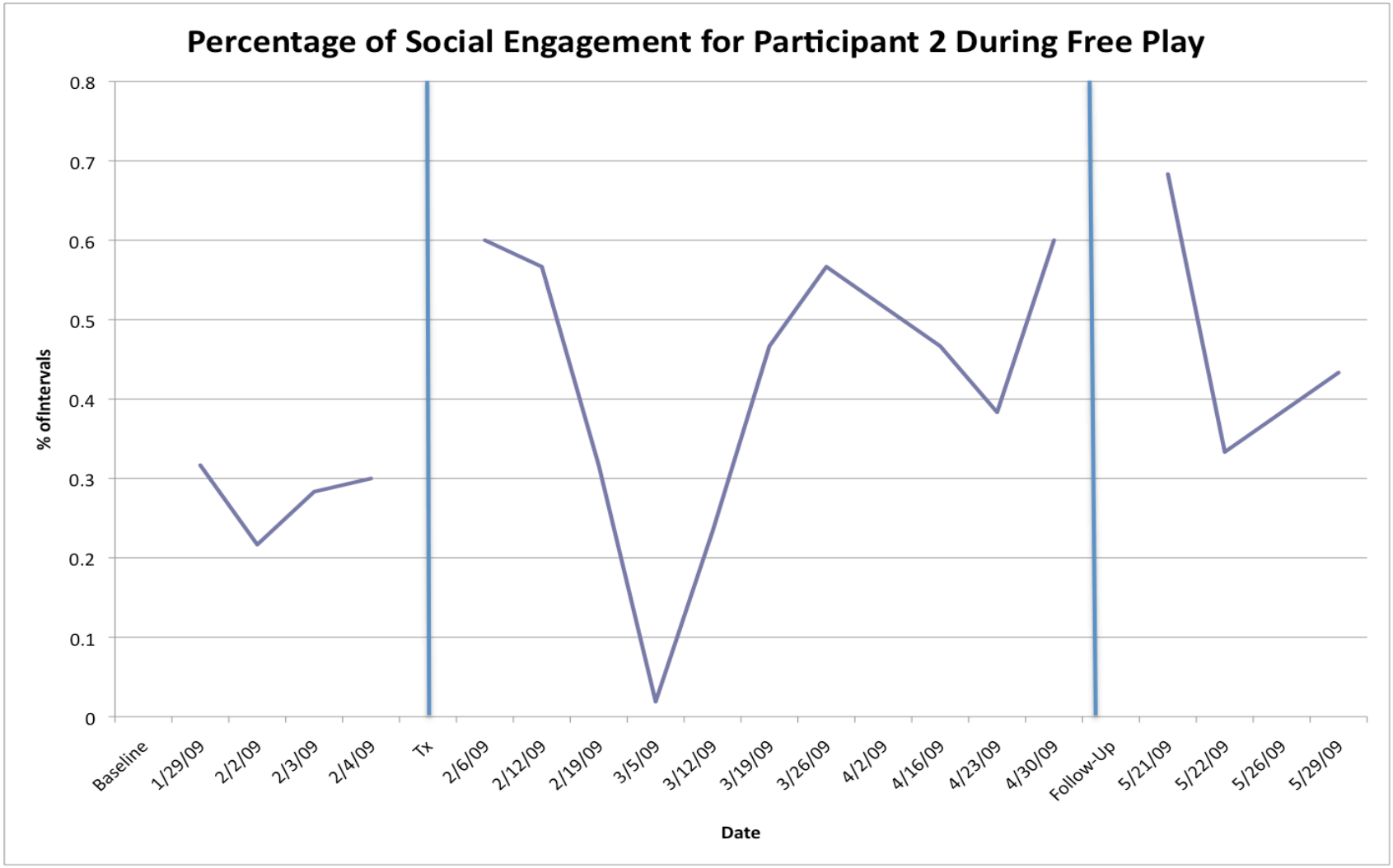

Figure 7. Percentage of Social Engagement for Participant 2 During Free Play

The PND for Participant 2 for social initiations during the analog free play period was calculated to be 36.36% between baseline and intervention periods and 75% between baseline and follow-up periods. This means, according to the PND, there was no effect for social initiations from baseline to treatment, but effective results between baseline and follow-up. For social responses, the PND was 63.64% between baseline and intervention phases and 50% between baseline and follow-up phases, indicating questionable effects for both periods during the analog free play phase. The PND for total social engagement was calculated to be 72.73% between baseline and intervention phases, indicating an effective treatment, and 100% between baseline and follow-up periods, indicating a very effective treatment.

The effect size for Participant 2 for analog free play between baseline and treatment periods for social initiations (*ES*=0.40) was small. The effect sizes for social responses (*ES*=1.00) and total social engagement (*ES*=1.12) were large. During the analog free play period, the effect sizes between baseline and follow-up phases for social initiations (*ES*=1.47), social responses (*ES*=0.86), and total social engagement (*ES*=1.51) were large.

Participant 3

Participant 3 attended 19 of the 22 social skill sessions. Participant 3 was present for all four of the baseline observations, 9 of the 11 treatment observations, and all four of the follow-up observations. During the analog free play period, Participant 3 initiated social interactions with peers an average of 8% of baseline intervals, 7% of treatment intervals, and 6% of follow-up intervals (see Figure 8). Participant 3 made social responses to the other children in the group during an average of 37% of the baseline

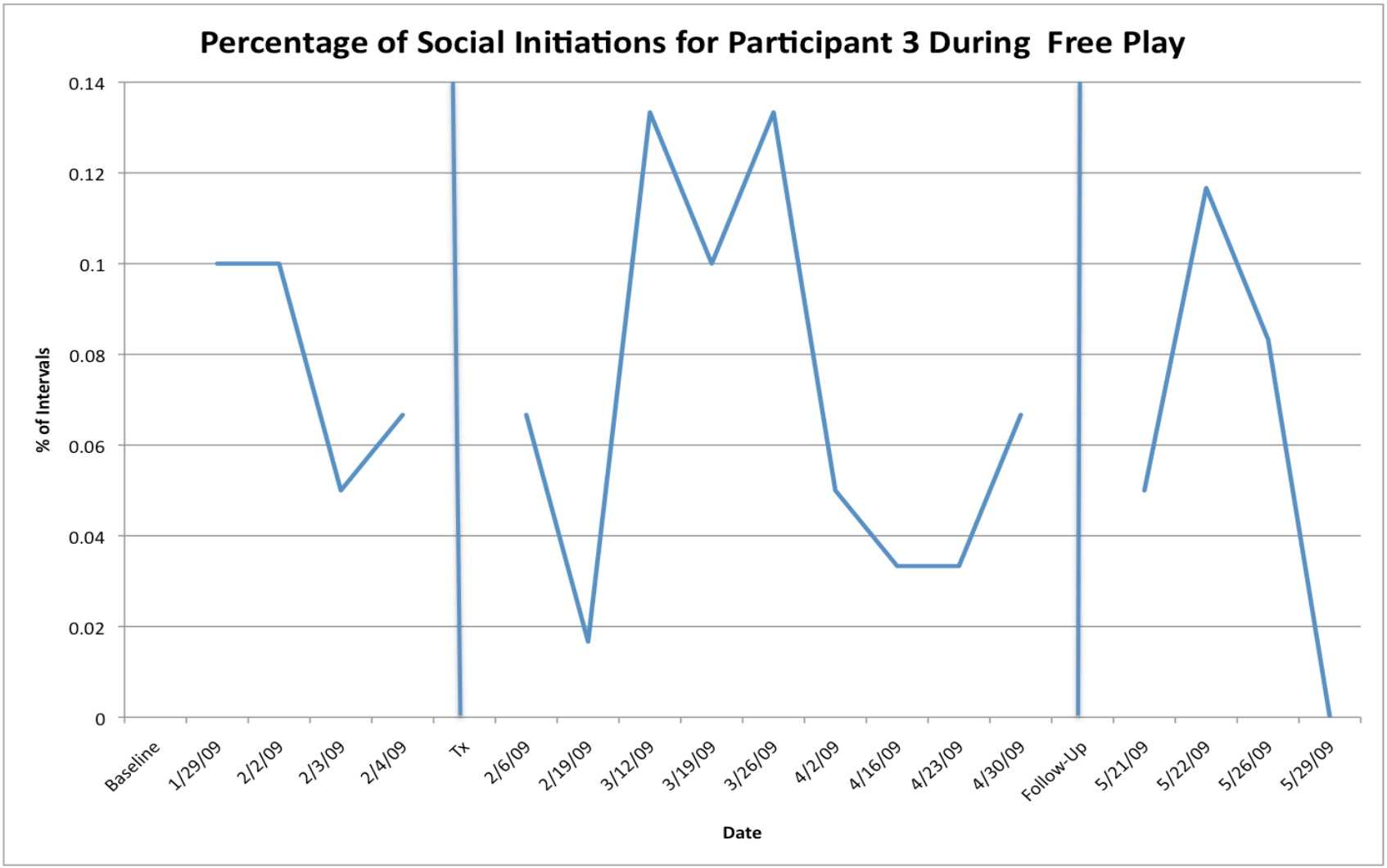

Figure 8. Percentage of Social Initiations for Participant 3 During Free Play

intervals, 46% of treatment intervals, and 53% of follow-up intervals (see Figure 9). Social engagement was noted in an average of 45% of the baseline intervals, 53% of treatment intervals, and 58% of follow-up intervals (see Figure 10).

The PND for Participant 3 for social initiations during analog free play was calculated to be 22.22% between baseline and treatment periods and 25% between baseline and follow-up periods. For social responses, the PND was 11.11% between baseline and treatment phases, and 25% between baseline and follow-up phases. The PND for total social engagement was calculated to be 22% between baseline and treatment periods and 50% between baseline and follow-up periods. In sum, there were no treatment effects, based on PND results, except for social engagement between baseline and follow-up, which was a questionable effect.

The effect size for Participant 3 during analog free play between baseline and treatment periods for social initiations (*ES*=-0.22) indicated a slightly adverse effect. The effect sizes for social responses (*ES*=0.38) and total social engagement (*ES*=0.37) were small. During analog free play, the effect size between baseline and follow-up phases for social initiations (*ES*=-0.39) was negative. The effect sizes for social responses (*ES*=0.45) and total social engagement (*ES*=0.41) were small.

Participant 4

Participant 4 attended 19 of the 22 social skill sessions. Participant 4 was present for all four of the baseline observations, 9 of the 11 treatment observations, and all four of the follow-up observations. During the analog free play period, Participant 4 initiated social interactions with peers an average of 2% of baseline intervals, 5% of treatment intervals, and 4% of follow-up intervals (see Figure 11).

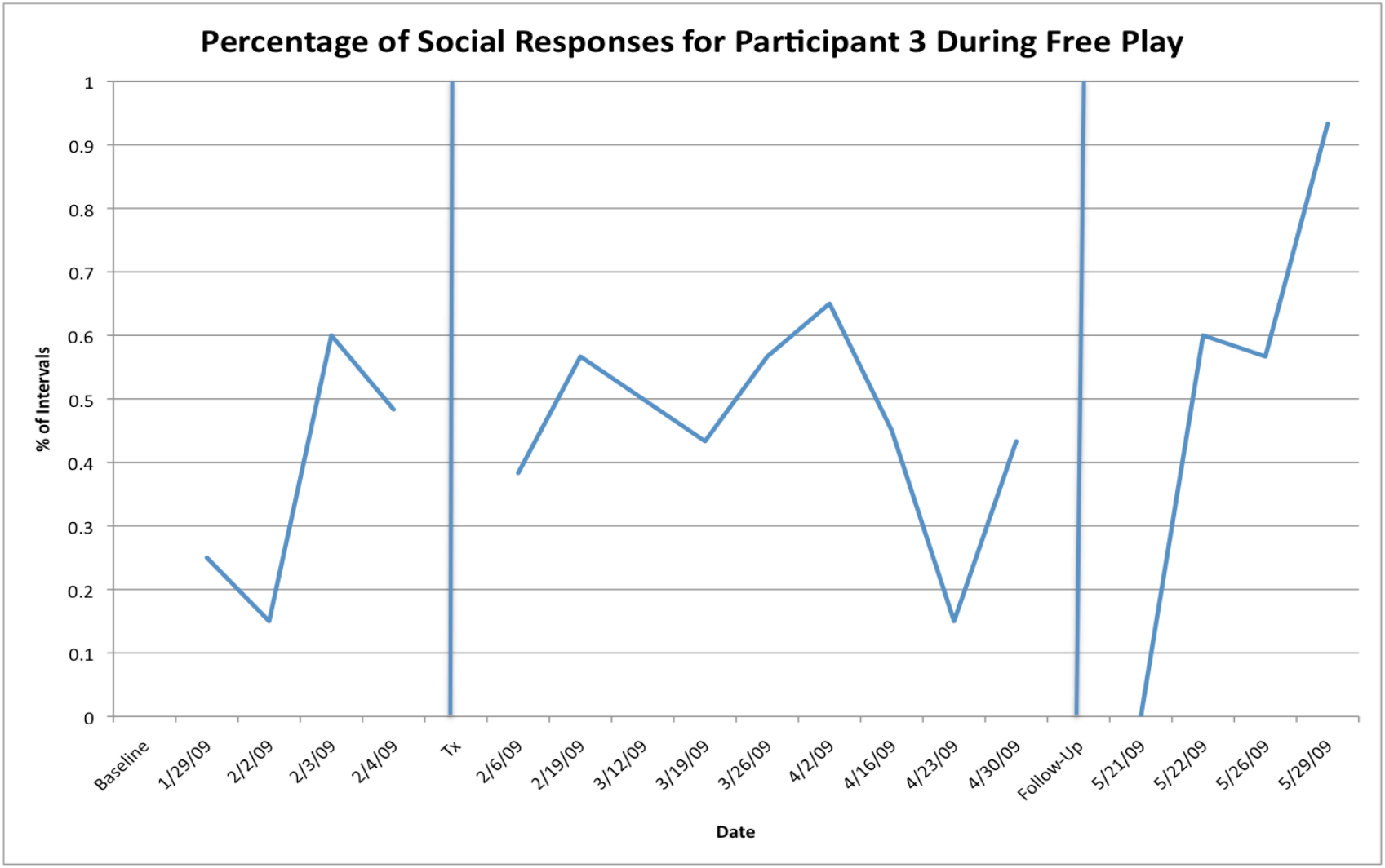

Figure 9. Percentage of Social Responses for Participant 3 During Free Play

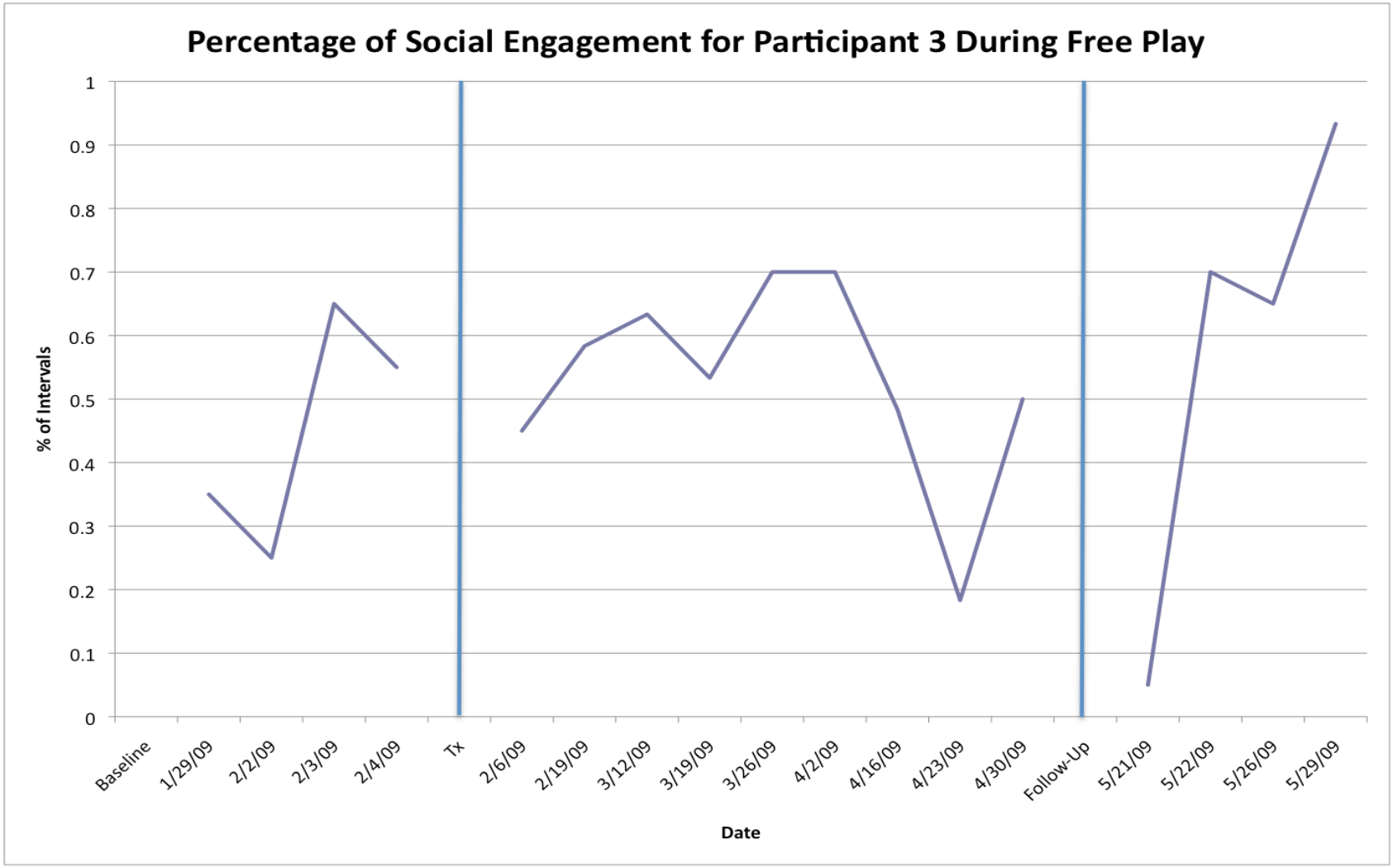

Figure 10. Percentage of Social Engagement for Participant 3 During Free Play

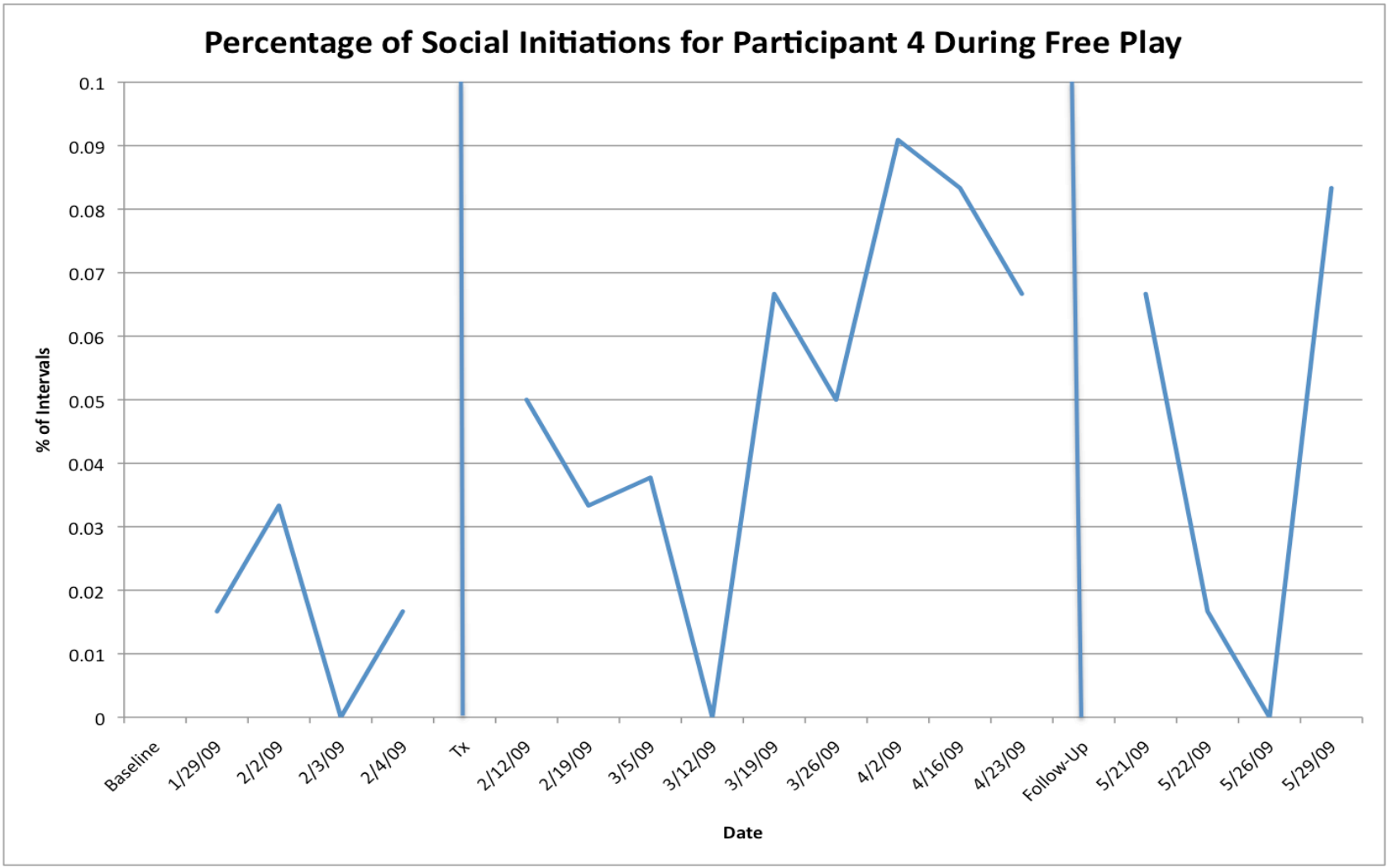

Figure 11. Percentage of Social Initiations for Participant 4 During Free Play

Participant 4 made social responses to the other children in the group during an average of 2% of the baseline intervals, 4% of treatment intervals, and 10% of follow-up intervals (see Figure 12). Social engagement was noted in an average of 3% of the baseline intervals, 10% of treatment intervals, and 14% of follow-up intervals (see Figure 13).

The PND for Participant 4 for social initiations during analog free play was calculated to be 77.78% between baseline and treatment periods and 50% between baseline and follow-up periods, indicating effective and questionable treatment results, respectively. For social responses, the PND was 22.22% between baseline and treatment phases, and 75% between baseline and follow-up phases. These results indicate no effect between baseline and treatment, but an effective treatment between baseline and follow-up for social responses. The PND for total social engagement was calculated to be 66.76% between baseline and treatment periods and 50% between baseline and follow-up periods, both questionable effects by PND standards.

The effect sizes for Participant 4 during analog free play between baseline and treatment periods for social initiations (*ES*=1.53), social responses (*ES*=0.90), and total social engagement (*ES*=1.42) were large. During analog free play, the effect size between baseline and follow-up phases for social initiations (*ES*=0.80), social responses (*ES*=1.99), and total social engagement (*ES*=1.53) were large. Tables 8 and 9 summarize the individual and mean effects sizes for all participants during the analog free play period.

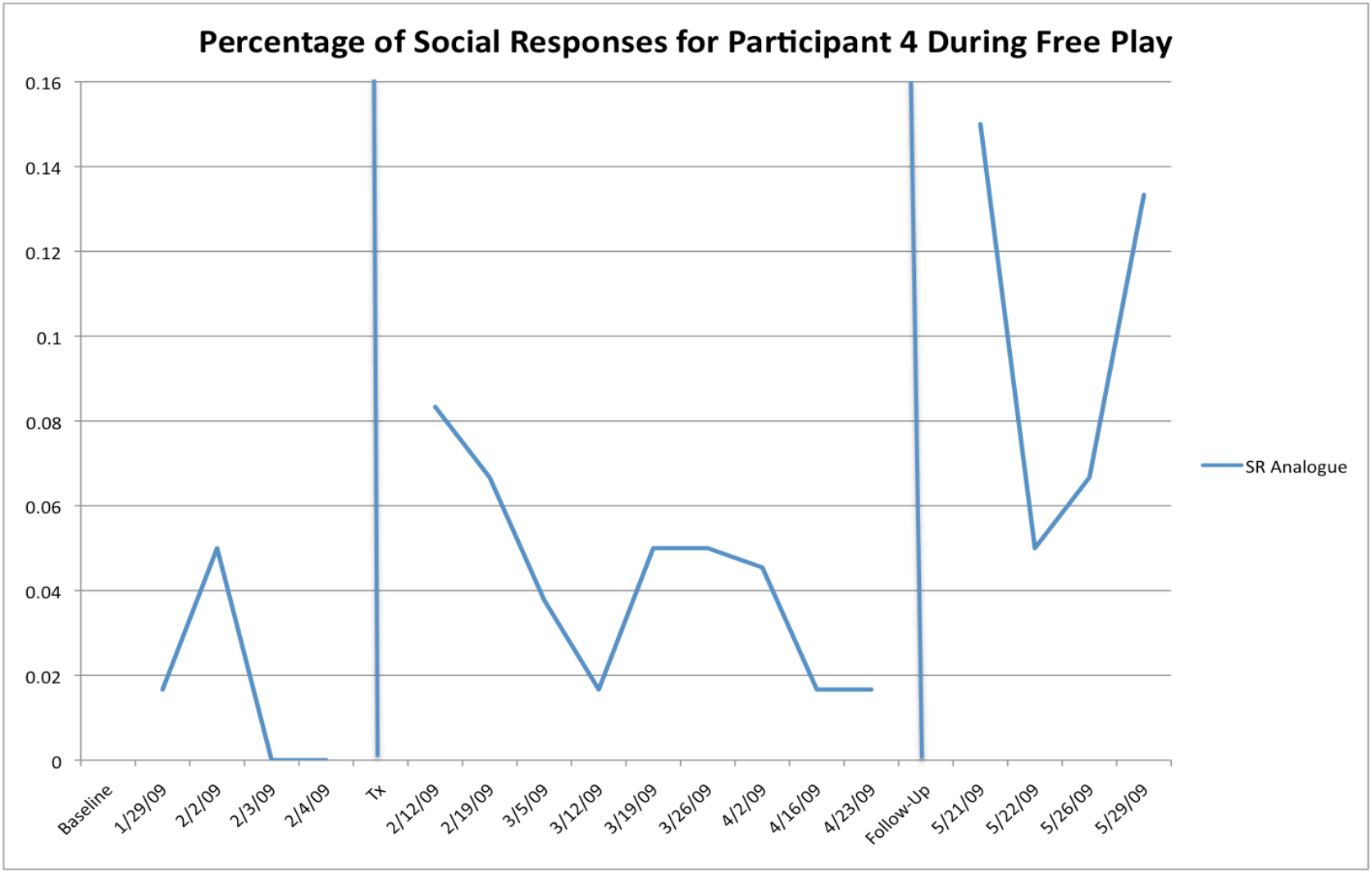

Figure 12. Percentage of Social Responses for Participant 4 During Free Play

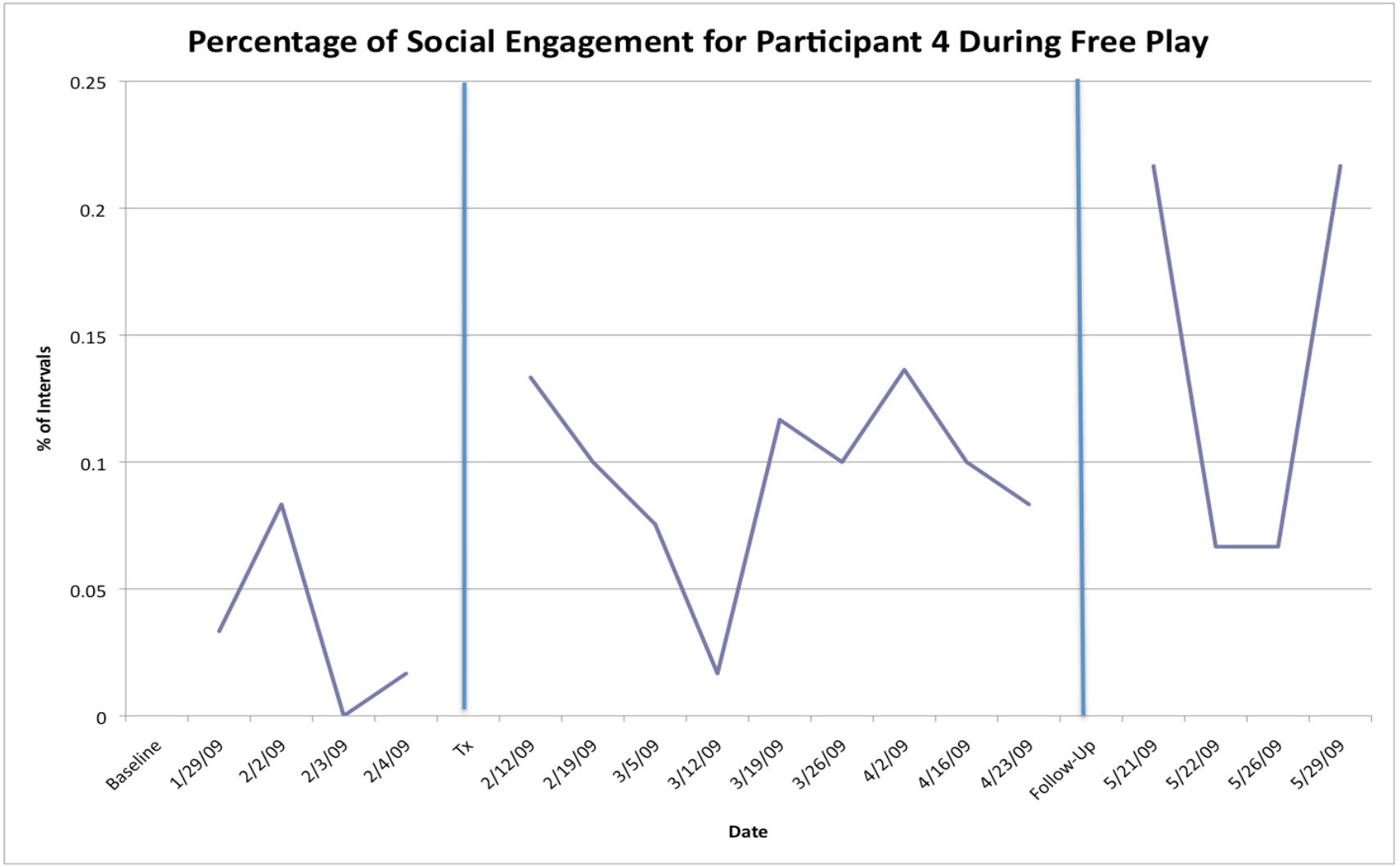

Figure 13. Percentage of Social Engagement for Participant 4 During Free Play

Table 8. Effect Sizes Between Baseline and Treatment for Analog Free Play

	Social Initiations	Social Responses	Social Engagement
Participant 1	-0.16	0.59	0.49
Participant 2	0.40	1.00	1.12
Participant 3	-0.22	0.38	0.37
Participant 4	1.53	0.90	1.42
Mean	0.39	0.72	0.85

Table 9. Effect Sizes Between Baseline and Follow-Up for Analog Free Play

	Social Initiations	Social Responses	Social Engagement
Participant 1	-0.45	-0.36	-0.50
Participant 2	1.47	0.86	1.51
Participant 3	-0.39	0.45	0.41
Participant 4	0.80	1.99	1.53
Mean	0.36	0.73	0.74

Overall, effect size data collected suggest that Superheroes Social Skills for Children with Autism is effective in increasing social responding and total engagement in individuals with ASD during analog free play. Progress was seen between baseline and treatment phases, as well as between baseline and follow-up phases of the study, with the exception of Participant 1. The program was also effective in increasing social initiations for Participants 2 and 4. PND results were more variable. This research question was satisfied with the data collected.

Research Question #2

2. What is the overall effectiveness (e.g., effect size and percentage of nonoverlapping data points) of Superheroes Social Skills for Children with Autism, as measured by observational data taken during a naturalistic setting, such as recess? (Measured by Bellini's (2007) social interaction observation system.)

All Participants

The study participants initiated social interactions with peers during the recess observation period an average of 2% of intervals during baseline, 7.5% of treatment intervals, and 11.75% of intervals during the follow-up period. Participants made social responses to other children during recess an average of 7% of intervals during baseline, 39% of intervals during treatment, and 36.25% of intervals during follow-up. Overall social engagement, on average, was 9% of baseline intervals, 46.75% of treatment intervals, and 48.75% of follow-up intervals for recess.

The average PND for all participants for social initiations was 62.5% between baseline and treatment phases and 100% between baseline and follow-up phases for recess. These results indicate questionable effects between baseline and treatment and very effective effects between baseline and follow-up for social initiations, according to PND interpretation guidelines. The PND, on average, for all participants during recess for social responses was 87.5% between baseline and treatment periods and 87.5% between baseline and follow-up periods, both effective results. For recess, the overall PND for participants, on average, for social engagement was 87.5% between baseline and

treatment phases, and 100% between baseline and follow-up phases, indicating effective and very effective treatment results, respectively.

Average effect sizes for recess were calculated between baseline and treatment periods, as well as between baseline and follow-up periods for all 4 participants. Large effect sizes, on average for participants, were found for social initiations (*ES*=1.27), social responses (*ES*=1.96), and total social engagement (*ES*=2.34) during recess, reflecting the change between baseline and treatment periods. Large effect sizes, on average, were also found between baseline and follow-up phases during recess for social initiations (*ES*=3.03), social responses (*ES*=2.74), and total social engagement (*ES*=3.42).

Participant 1

Recess data were collected for Participant 1 during four baseline observations, six treatment observations, and two follow-up observations. During recess, Participant 1 initiated social interactions with peers an average of 3% of baseline intervals, 11% of treatment intervals, and 24% of follow-up intervals (see Figure 14). Participant 1 made social responses to the other children on the playground during an average of 3% of the baseline intervals, 39% of treatment intervals, and 23% of follow-up intervals (see Figure 15). Social engagement during recess was noted in an average of 7% of the baseline intervals, 51% of treatment intervals, and 48% of follow-up intervals (see Figure 16).

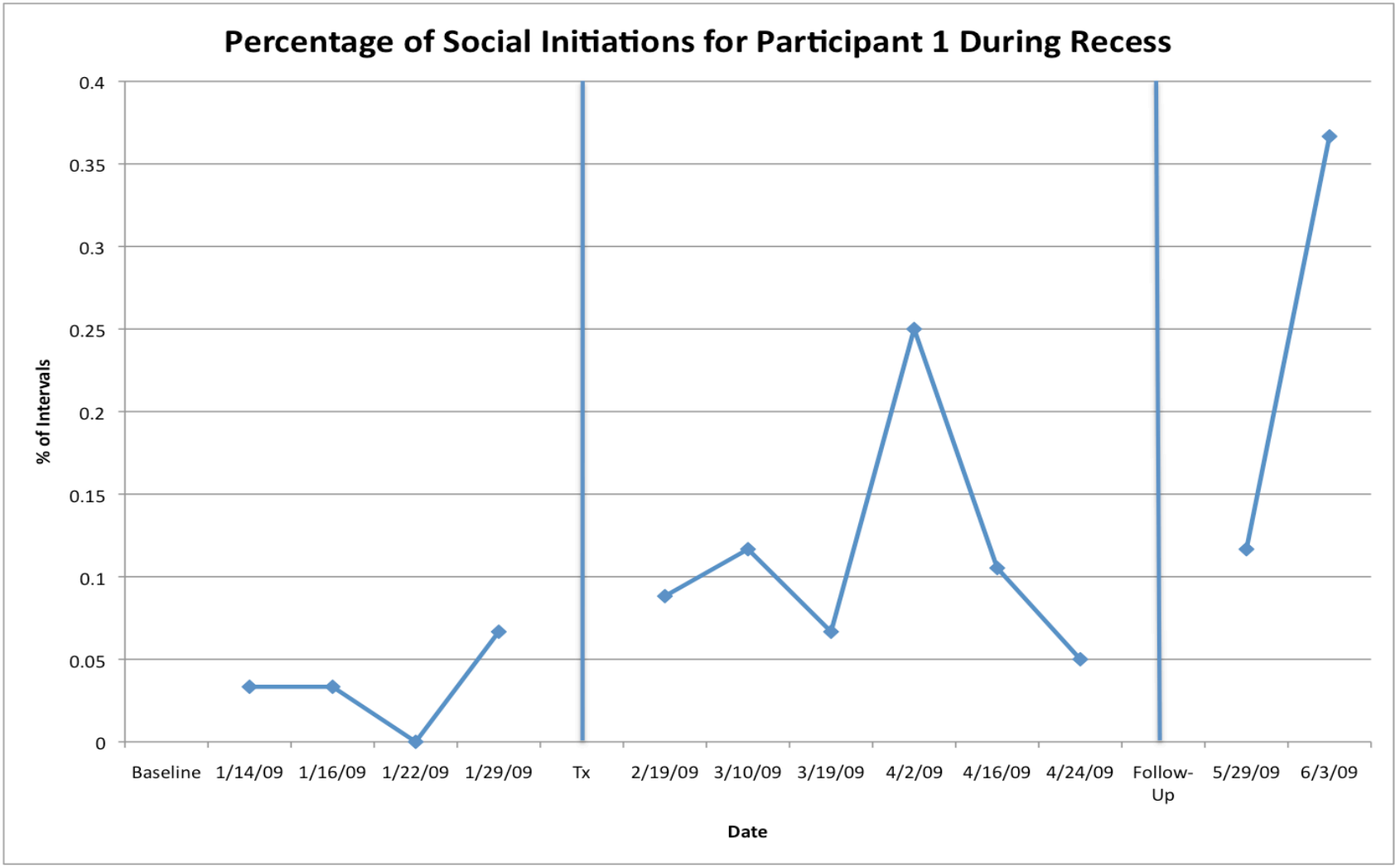

Figure 14. Percentage of Social Initiations for Participant 1 During Recess

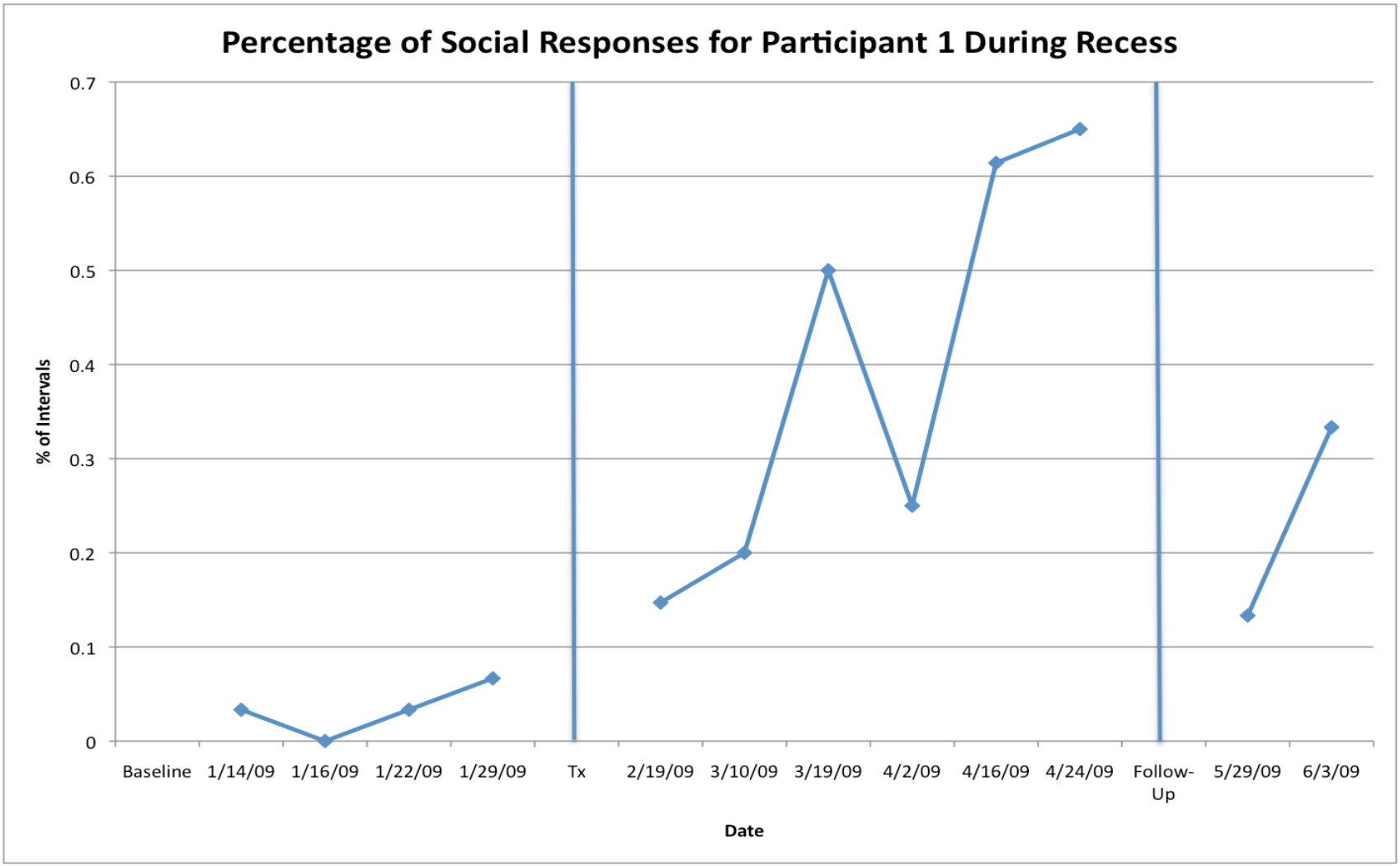

Figure 15. Percentage of Social Responses for Participant 1 During Recess

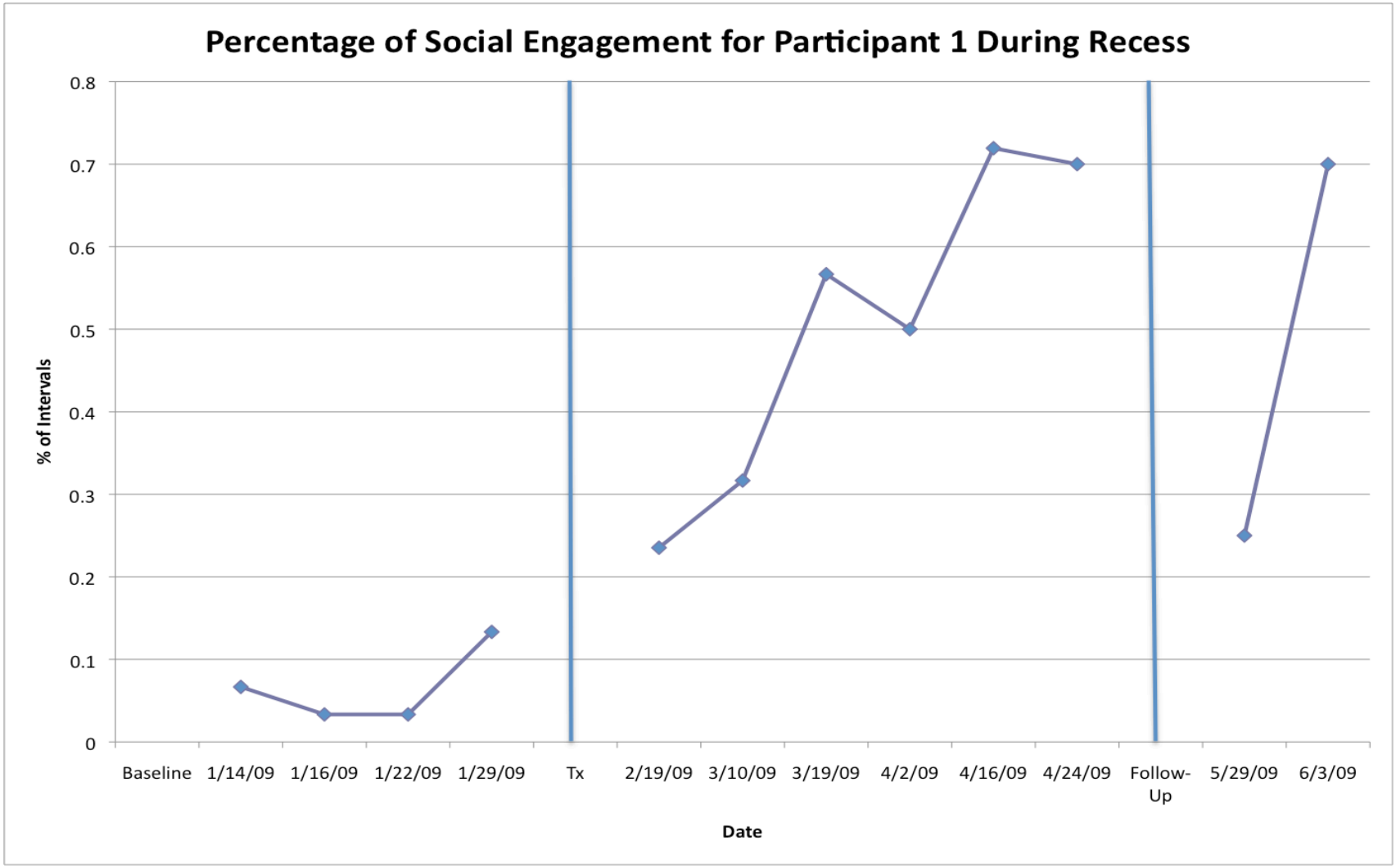

Figure 16. Percentage of Social Engagement for Participant 1 During Recess

The PND during recess for Participant 1 for social initiations was calculated to be 66.67% between baseline and treatment periods and 100% between baseline and follow-up periods, indicating questionable and very effective results, respectively. For social responses during recess, the PND was 100% between baseline and treatment phases, and 100% between baseline and follow-up phases. The recess PND for total social engagement was calculated to be 100% between baseline and treatment periods and 100% between baseline and follow-up periods. These results all indicate very effective treatment results for social responses and total social engagement, based on the interpretation guidelines for PND. The effect sizes for recess between baseline and treatment phases for social initiations (*ES*=1.38), social responses (*ES*=2.27), and total social engagement (*ES*=2.98) were large. The effect sizes for recess between baseline and follow-up periods for social initiations (*ES*=1.63), social responses (*ES*=1.93), and total social engagement (*ES*=1.78) were also large.

Participant 2

Recess data were collected for Participant 2 during four baseline observations, six treatment observations, and two follow-up observations. During recess, Participant 2 initiated social interactions with peers an average of 3% of baseline intervals, 12% of treatment intervals, and 11% of follow-up intervals (see Figure 17). Participant 2 made social responses to the other children on the playground during an average of 20% of the baseline intervals, 37% of treatment intervals, and 46% of follow-up intervals (see Figure 18). Social engagement was noted in an average of 23% of the baseline intervals, 49% of treatment intervals, and 58% of follow-up intervals for recess (see Figure 19).

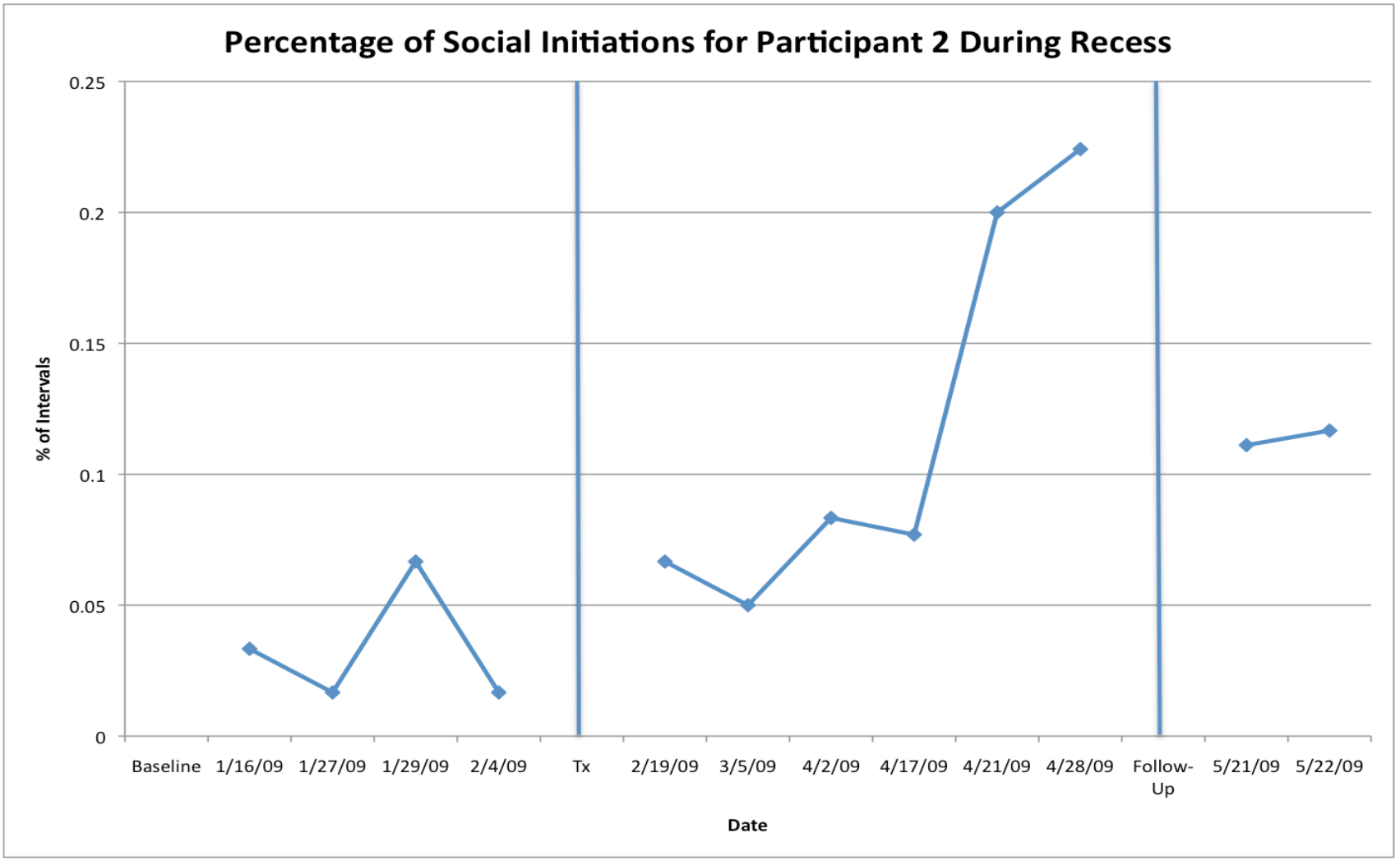

Figure 17. Percentage of Social Initiations for Participant 2 During Recess

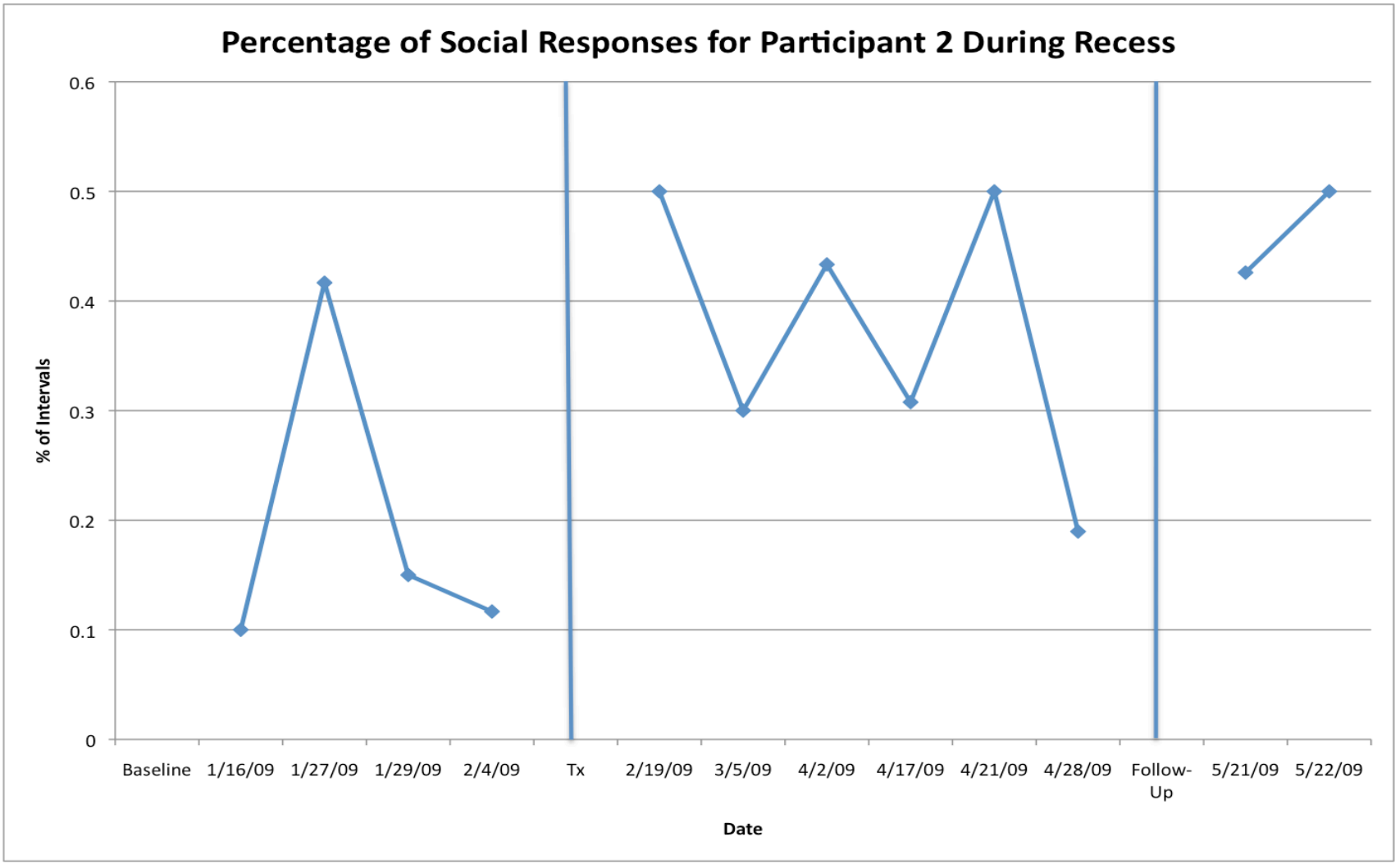

Figure 18. Percentage of Social Responses for Participant 2 During Recess

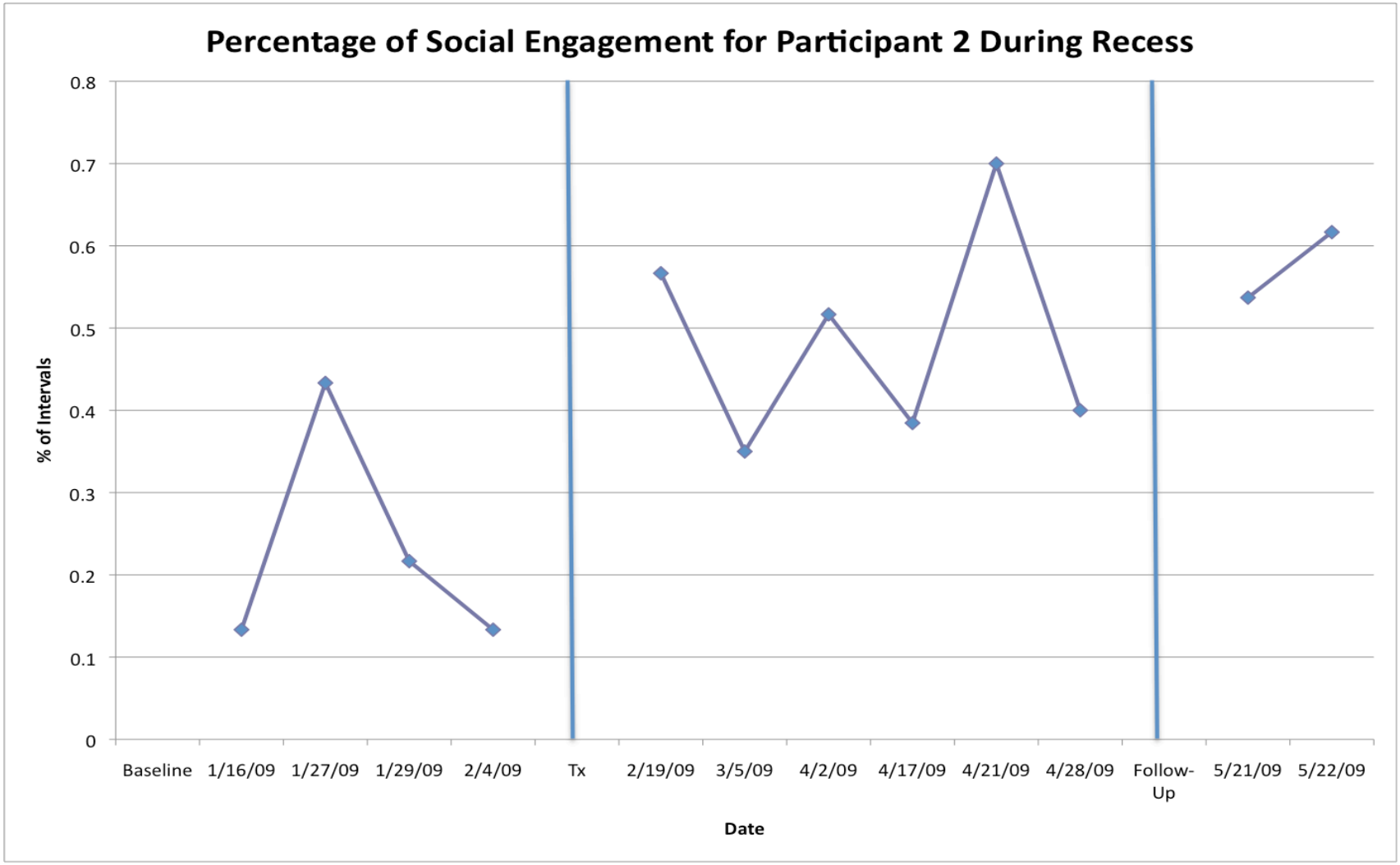

Figure 19. Percentage of Social Engagement for Participant 2 During Recess

The PND during recess for Participant 2 for social initiations was calculated to be 66.67% between baseline and treatment periods and 100% between baseline and follow-up periods. This indicates a questionable effect between baseline and treatment. For social responses during recess, the PND was 50% between baseline and treatment phases, and 100% between baseline and follow-up phases, which represents questionable and very effective results, respectively. The recess PND for total social engagement was calculated to be 50% between baseline and treatment periods and 100% between baseline and follow-up periods. Thus, for total social engagement, there were questionable results between baseline and treatment and very effective results between baseline and treatment for recess as dictated by the interpretation guidelines for PND. The effect sizes for recess between baseline and treatment phases for social initiations (*ES*=1.44), social responses (*ES*=1.02), and total social engagement (*ES*=1.53) were large. The effect sizes for recess between baseline and follow-up periods for social initiations (*ES*=3.39), social responses (*ES*=1.74), and total social engagement (*ES*=2.36) were also large.

Participant 3

Recess data were collected for Participant 3 during three baseline observations, six treatment observations, and two follow-up observations. During recess, Participant 3 initiated social interactions with peers an average of 1% of baseline intervals, 2% of treatment intervals, and 3% of follow-up intervals (see Figure 20). Participant 3 made social responses to the other children on the playground during an average of 3% of the baseline intervals, 36% of treatment intervals, and 14% of follow-up intervals (see Figure 21). Social engagement was noted in an average of 3% of the baseline intervals, 38% of treatment intervals, and 18% of follow-up intervals (see Figure 22).

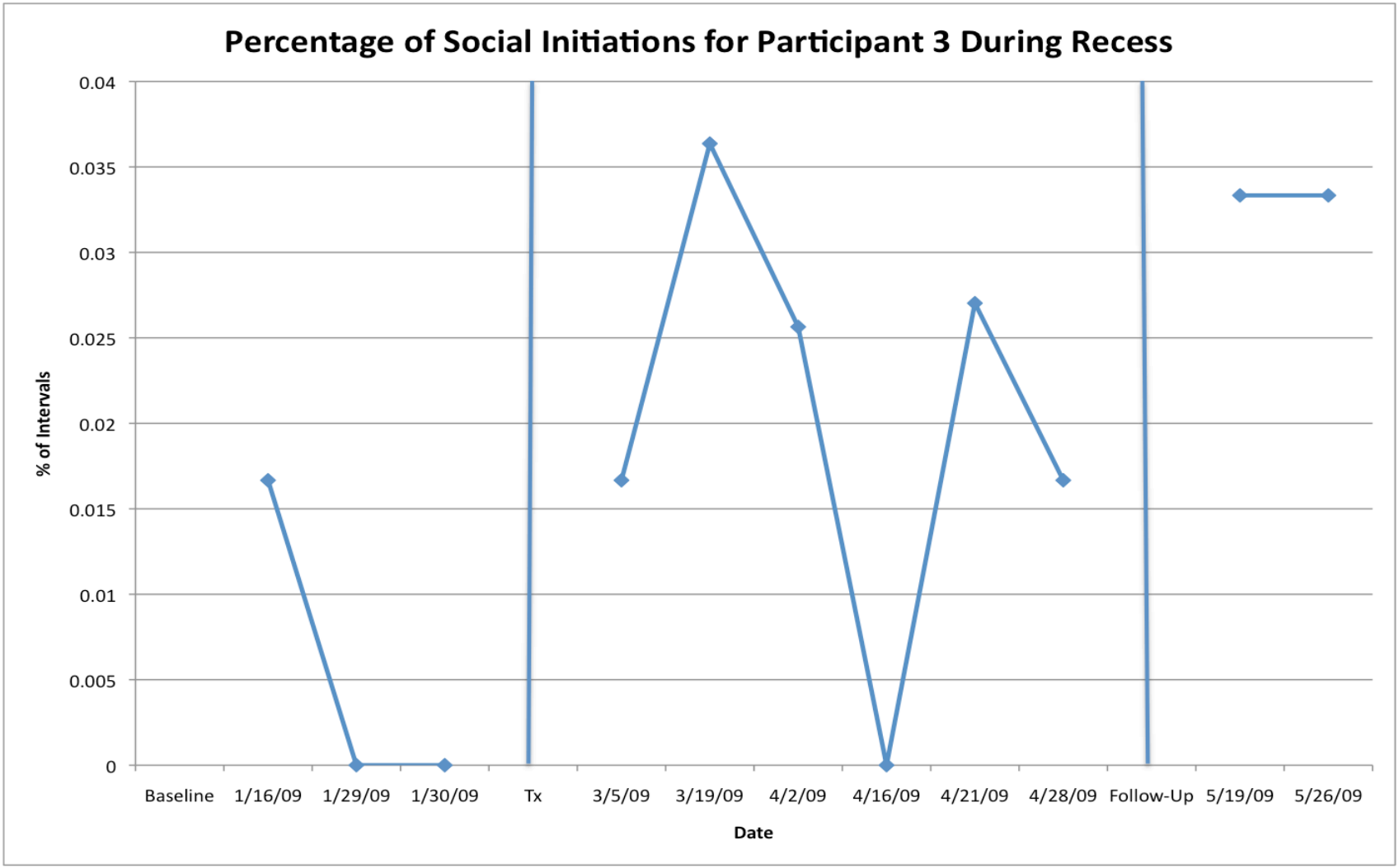

Figure 20. Percentage of Social Initiations for Participant 3 During Recess

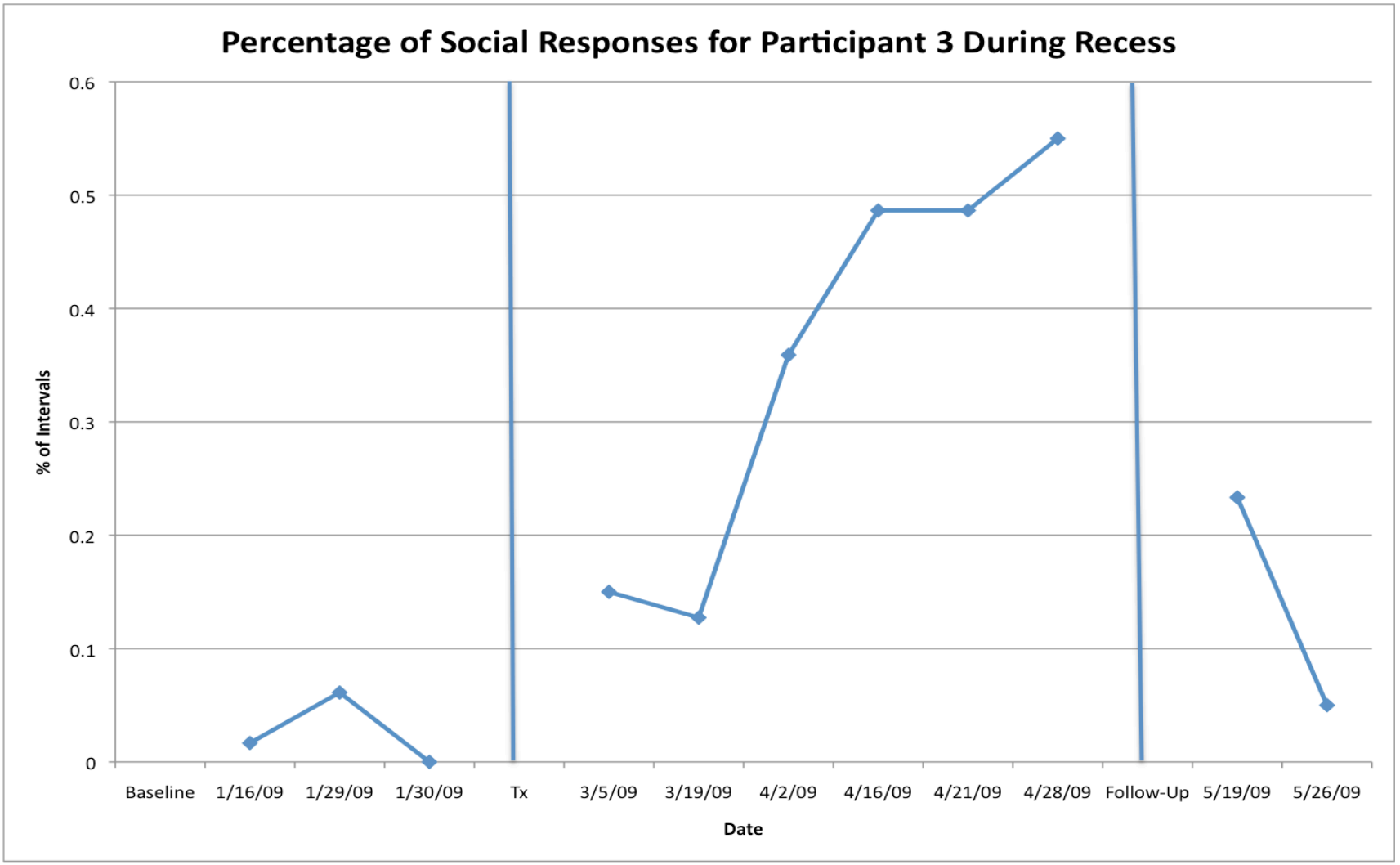

Figure 21. Percentage of Social Responses for Participant 3 During Recess

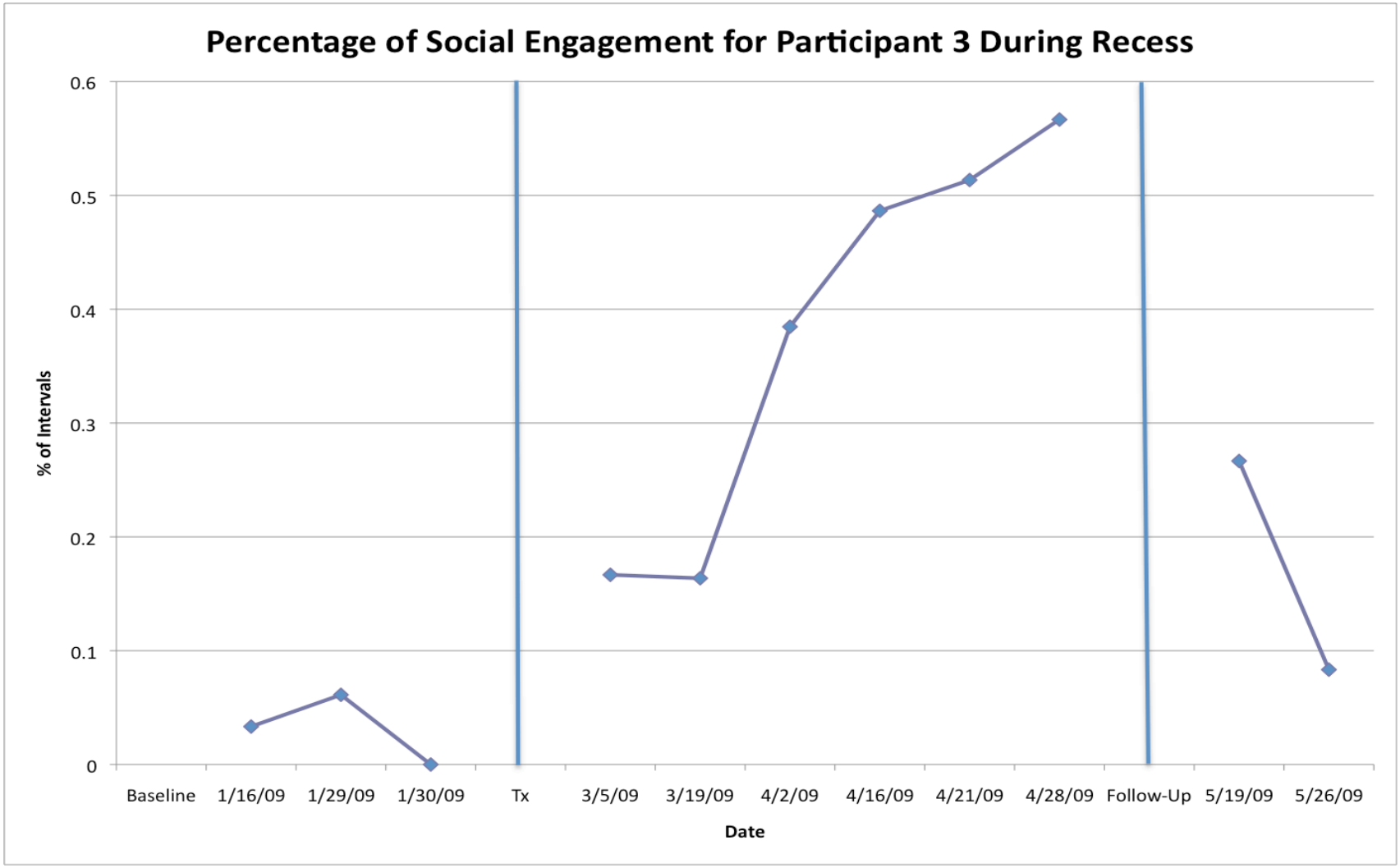

Figure 22. Percentage of Social Engagement for Participant 3 During Recess

The PND during recess for Participant 3 for social initiations was calculated to be 50% between baseline and treatment periods and 100% between baseline and follow-up periods, which reflect questionable and very effective results, respectively. For social responses during recess, the PND was 100% between baseline and treatment phases, and 50% between baseline and follow-up phases. These results indicate that there were very effective effects between baseline and treatment and questionable effects between baseline and follow-up for social responses during recess. The recess PND for total social engagement was calculated to be 100% between baseline and treatment periods and 100% between baseline and follow-up periods. These both indicate very effective treatment results for total social engagement, based on the interpretation guidelines for PND. The effect sizes for recess between baseline and treatment phases for social initiations (*ES*=1.14), social responses (*ES*=2.51), and total social engagement (*ES*=2.71) were large. The effect sizes for recess between baseline and follow-up periods for social initiations (*ES*=2.89), social responses (*ES*=1.19), and total social engagement (*ES*=1.48) were also large.

Participant 4

Recess data were collected for Participant 4 during three baseline observations, six treatment observations, and three follow-up observations. During recess, Participant 4 initiated social interactions with peers an average of 1% of baseline intervals, 5% of treatment intervals, and 9% of follow-up intervals (see Figure 23). Participant 4 made social responses to the other children on the playground during an average of 2% of the baseline intervals, 44% of treatment intervals, and 62% of follow-up intervals

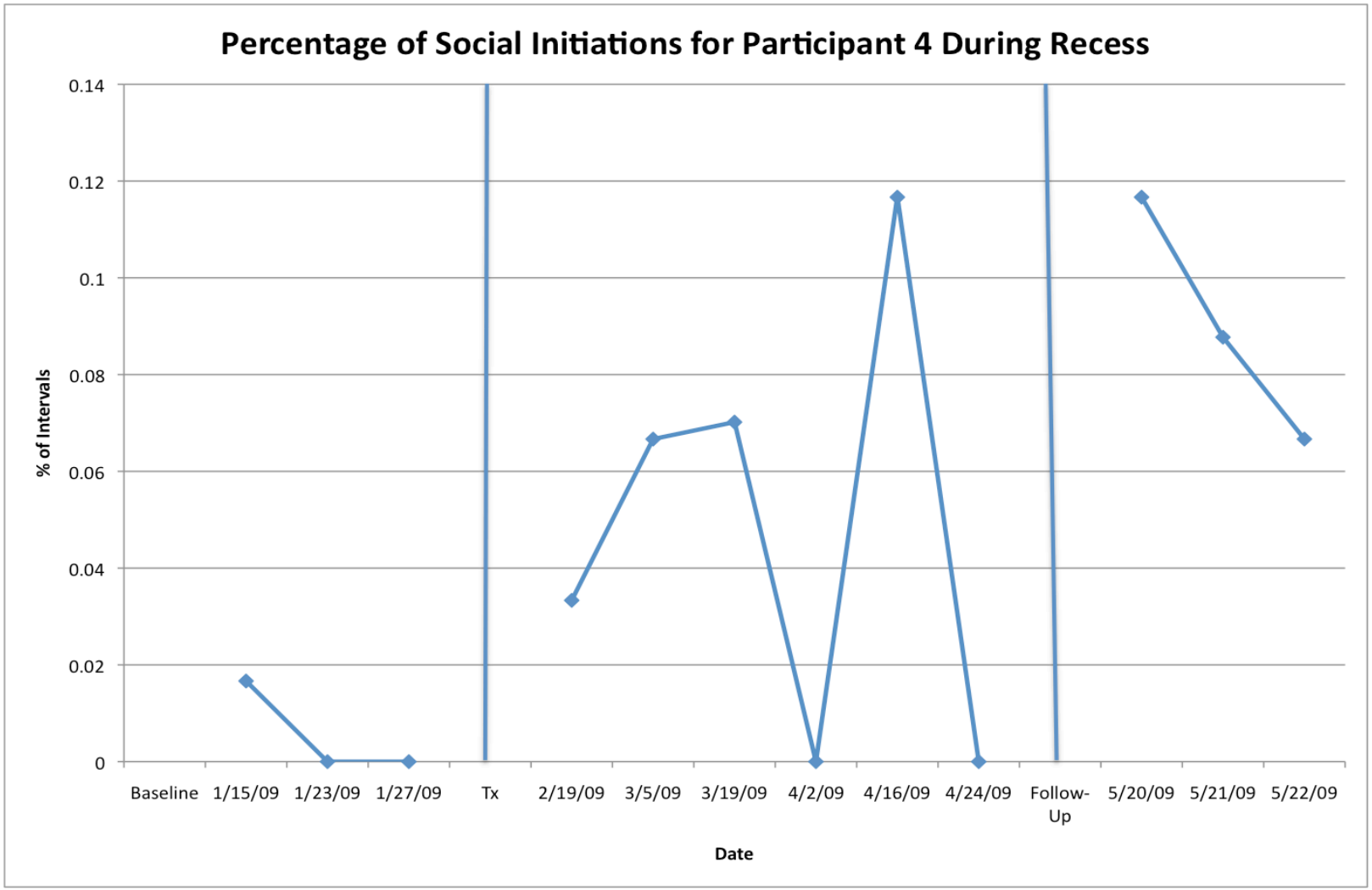

Figure 23. Percentage of Social Initiations for Participant 4 During Recess

(see Figure 24). Social engagement was noted in an average of 3% of the baseline intervals, 49% of treatment intervals, and 71% of follow-up intervals (see Figure 25).

The PND during recess for Participant 4 for social initiations was calculated to be 66.67% between baseline and treatment periods and 100% between baseline and follow-up periods, which are questionable and very effective results, respectively. For social responses during recess, the PND was 100% between baseline and treatment phases and 100% between baseline and follow-up phases. The recess PND for total social engagement was calculated to be 100% between baseline and treatment periods and 100% between baseline and follow-up periods. The results for social responses and total social engagement all indicate very effective treatments, based on the interpretation guidelines for PND. The effect sizes for recess between baseline and treatment phases for social initiations (*ES*=1.12), social responses (*ES*=2.03), and total social engagement (*ES*=2.14) were large. The effect sizes for recess between baseline and follow-up periods for social initiations (*ES*=4.2), social responses (*ES*=6.1), and total social engagement (*ES*=8.05) were also large. Tables 10 and 11 summarize the individual and mean effects sizes for all participants during the recess period.

Overall, effect size data collected suggest that Superheroes Social Skills for Children with Autism is extremely effective in increasing social initiating, social responding and total social engagement in individuals with ASD during recess. Progress was seen between baseline and treatment phases, as well as between baseline and follow-up phases of the study. PND results, overall, also demonstrated the efficacy of the program. This research question was satisfied with the data collected.

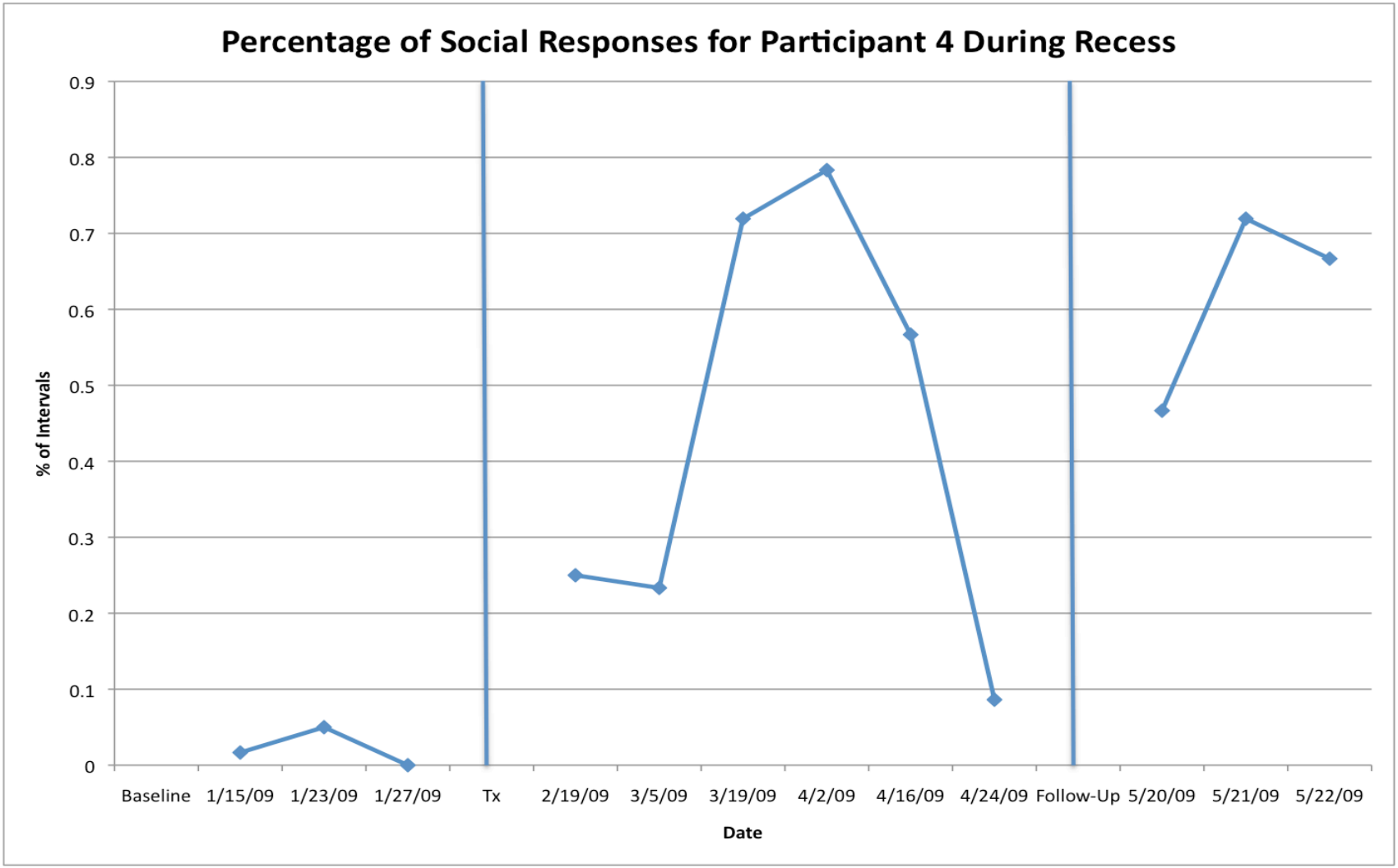

Figure 24. Percentage of Social Responses for Participant 4 During Recess

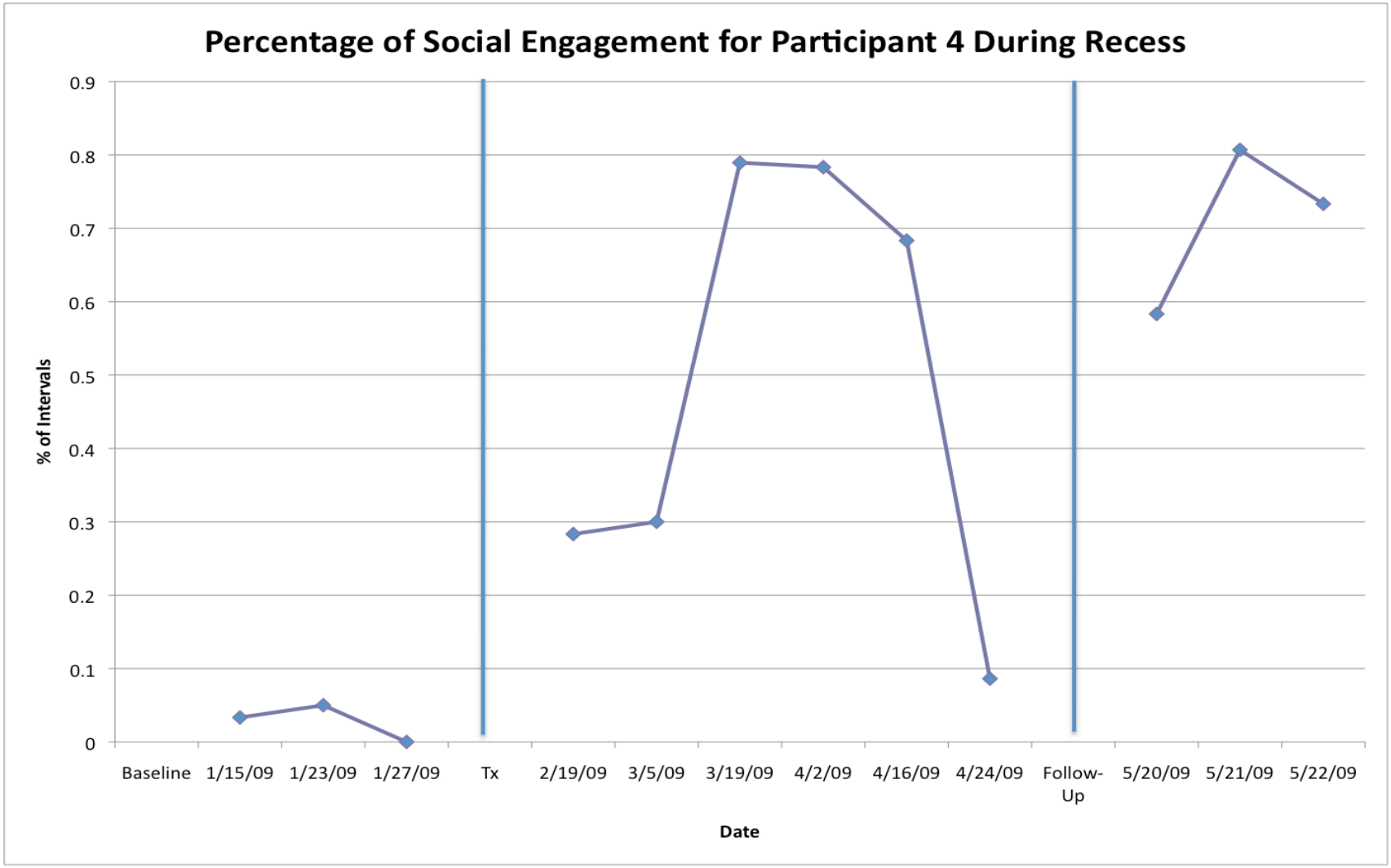

Figure 25. Percentage of Social Engagement for Participant 4 During Recess

Table 10. Effect Sizes Between Baseline and Treatment for Recess

	Social Initiations	Social Responses	Social Engagement
Participant 1	1.38	2.27	2.98
Participant 2	1.44	1.02	1.53
Participant 3	1.14	2.51	2.71
Participant 4	1.12	2.03	2.14
Mean	1.27	1.96	2.34

Table 11. Effect Sizes Between Baseline and Follow-Up for Recess

	Social Initiations	Social Responses	Social Engagement
Participant 1	1.63	1.93	1.78
Participant 2	3.39	1.74	2.36
Participant 3	2.89	1.19	1.48
Participant 4	4.20	6.10	8.05
Mean	3.03	2.74	3.42

Research Question #3

3. What is the overall effectiveness of Superheroes Social Skills for Children with Autism, as measured by pre- and postquantitative change scores from parent and teacher versions of the Social Responsiveness Scale?

Both parents and teachers completed the SRS about the 4 participants with autism spectrum disorders prior to the beginning of the study and then again after completion of the social skills program. The SRS total pretreatment score (T=79.5), as reported by the

parents, on average, decreased slightly posttreatment (*T*=75.75). This trend was seen again with the teachers, with a larger decrease. The mean teacher SRS total pretreatment score (*T*=67.25) declined posttreatment (*T*=54.25). For the teachers, these changes in scores reflect a difference between clinical and average categorizations (i.e., children on the spectrum typically achieve SRS *T*-scores of 60 or higher).

With the exception of Social Communication for the parents, there was a general decrease in all SRS scores pre- and posttreatment for the Social Awareness, Social Cognition, Motivation, and Autistic Mannerisms subscales. The parents, on average, endorsed the Social Communication subscale to very slightly rise pretreatment (*T*=76.75) to posttreatment (*T*=77). Although the parent scores did decrease after completion of the social skills program, all scores remained in clinical ranges (i.e., *T*-scores above 60) for ASD. The largest decrease, on average, was for the Autistic Mannerisms subscale. The subscales showing the least amount of positive change in scores, on average for the parents, were Social Communication and Social Cognition.

For the teachers, on average, all of the SRS treatment scales decreased from pre- and posttreatment. These decreases were larger than those of the parents across all subscales. Interestingly, the scores were lower to begin with on the teacher versions of the SRS, and many of the scores obtained posttreatment decreased to average ranges (i.e., *T*-scores less than 60). For example, on average, the teacher reported scores for the Social Cognition subscale decreased pretreatment (*T*=71) to posttreatment (*T*=58.25). Consistent with the parent group, the largest decrease, on average, was also found for the Autistic Mannerisms subscale. The SRS subscales showing the least amount of change in

scores, on average for the teachers, were Social Awareness and Social Motivation. A summary of these results is provided in Table 12.

Using Constantino's (2003) recommendations for determining substantial changes in SRS subscale scores (i.e., treatment effects), detectable changes were observed for all of the study participants. The most significant changes were largely on the teacher reports. Constantino (2003) purports that a reduction in subscale scores by 1 to 2 standard errors of measurement (i.e., variability of scores within the sampling distribution) between evaluation times, is considered substantial. On the individual graphs shown below, postscores falling below the dashed line (i.e., one standard error of measurement below the prescore) demonstrated a significant treatment effect.

Participant 1

For Participant 1, significant treatment effects were obtained for the following subscales on the parent version of the SRS: Social Communication (pretreatment *T*=108; posttreatment *T*=100), Social Motivation (pretreatment *T*=84; posttreatment *T*=62) and Autistic Mannerisms (pretreatment *T*=132; posttreatment *T*=117). The *T*-scores for the Social Awareness (pretreatment *T*=84; posttreatment *T*=77) and Social Cognition (pretreatment *T*=103; posttreatment *T*=101) subscales also did decrease slightly. On the teacher version of the SRS, significant treatment effects were achieved for all five of the subscales: Social Awareness (pretreatment *T*=72; posttreatment *T*=52), Social Cognition (pretreatment *T*=97, posttreatment *T*=59), Social Communication (pretreatment *T*=83; posttreatment *T*=52), Social Motivation (pretreatment *T*=63; posttreatment *T*=42), and Autistic Mannerisms (pretreatment *T*=103; posttreatment *T*=61). All but Autistic

Table 12. Mean Total SRS and Subscale Scores Pre- and Posttreatment

	Total	Social Awareness	Social Cognition	Social Communication	Social Motivation	Autistic Mannerisms
Pre-parent	79.5	69.75	74	76.75	65.5	89.25
Post-parent	75.75	65.75	72.5	77	60.75	81.75
Pre-teacher	67.25	63	71	67	56.5	70.75
Post-teacher	54.25	54.25	58.25	53.75	47.75	56

Mannerisms changed from clinical to average ranges, on the teacher version of the SRS. These results were compared graphically in Figures 26 and 27.

Participant 2

For Participant 2, there were not any significant treatment effects obtained for the subscales on the parent version of the SRS. In fact, most scores stayed the same or rose slightly: Social Awareness (pretreatment *T*=55; posttreatment *T*=62), Social Cognition (pretreatment *T*=56; posttreatment *T*=56), Social Communication (pretreatment *T*=66; posttreatment *T*=69), Social Motivation (pretreatment *T*=56; posttreatment *T*=59), and Autistic Mannerisms (pretreatment *T*=62; posttreatment *T*=65). These scores are shown graphically in Figure 28. On the teacher version of the SRS, significant treatment effects were achieved for three of the subscales: Social Communication (pretreatment *T*=73; posttreatment *T*=60), Social Motivation (pretreatment *T*=57; posttreatment *T*=48), and

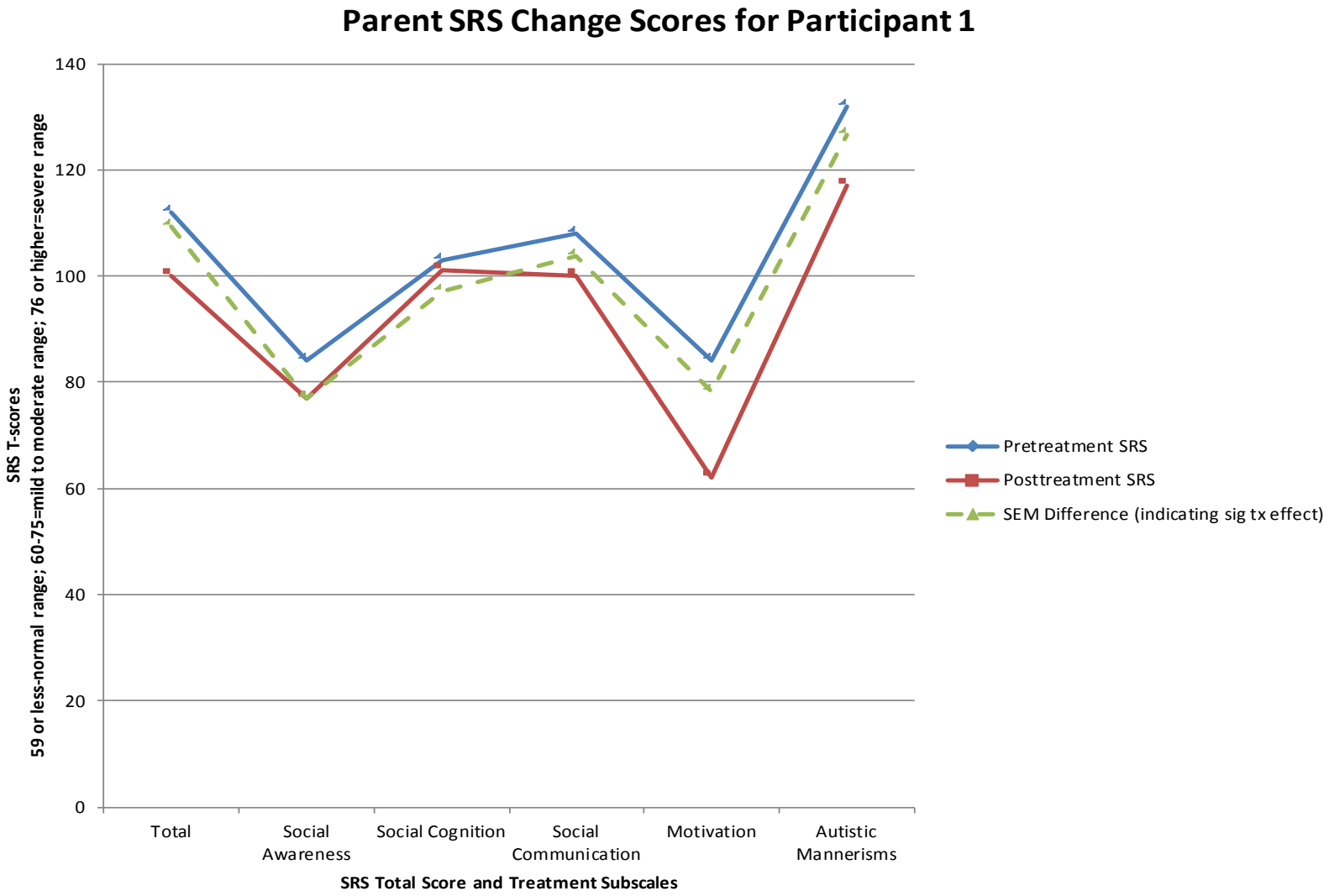

Figure 26. Parent SRS Change Scores for Participant 1

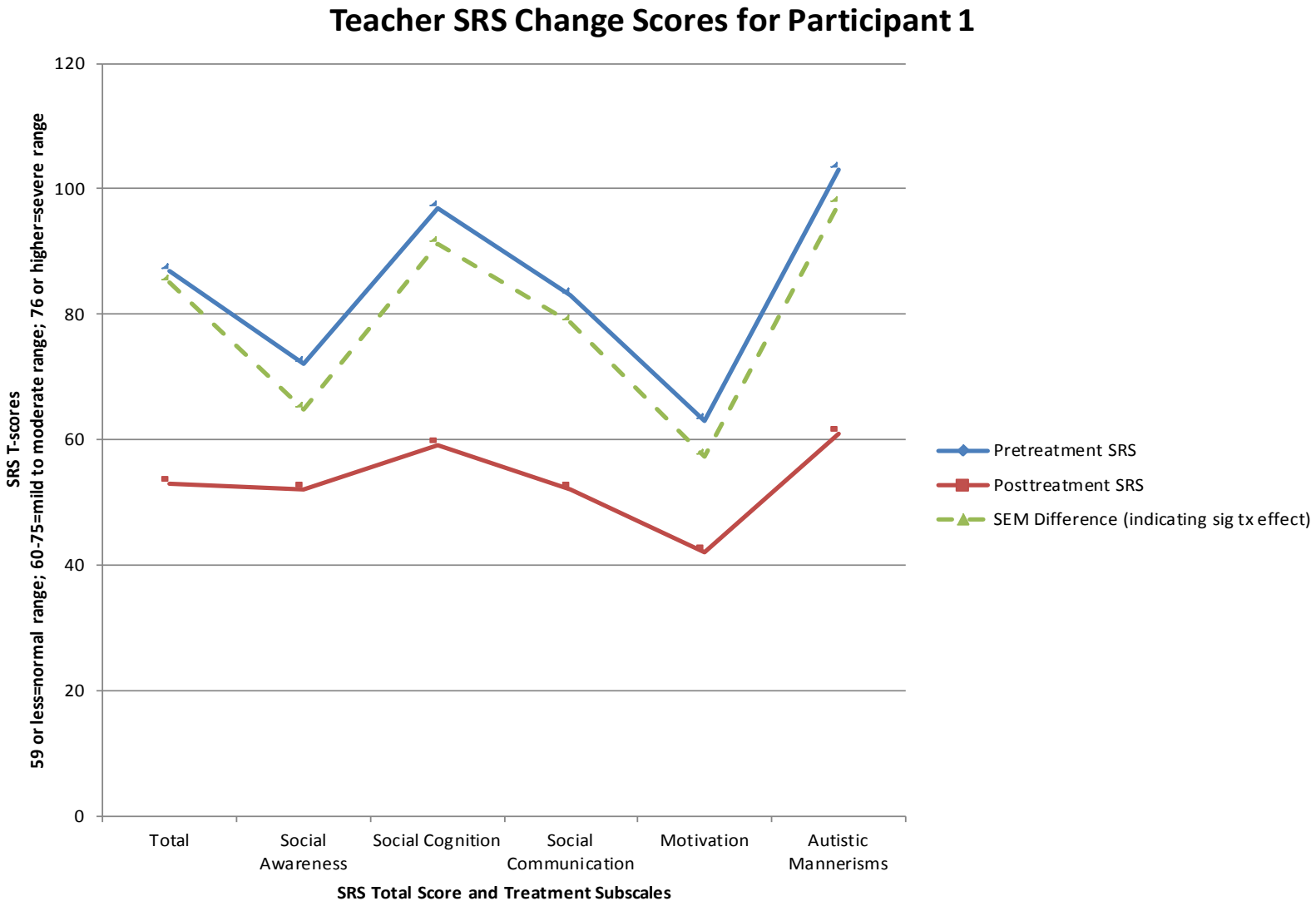

Figure 27. Teacher SRS Change Scores for Participant 1

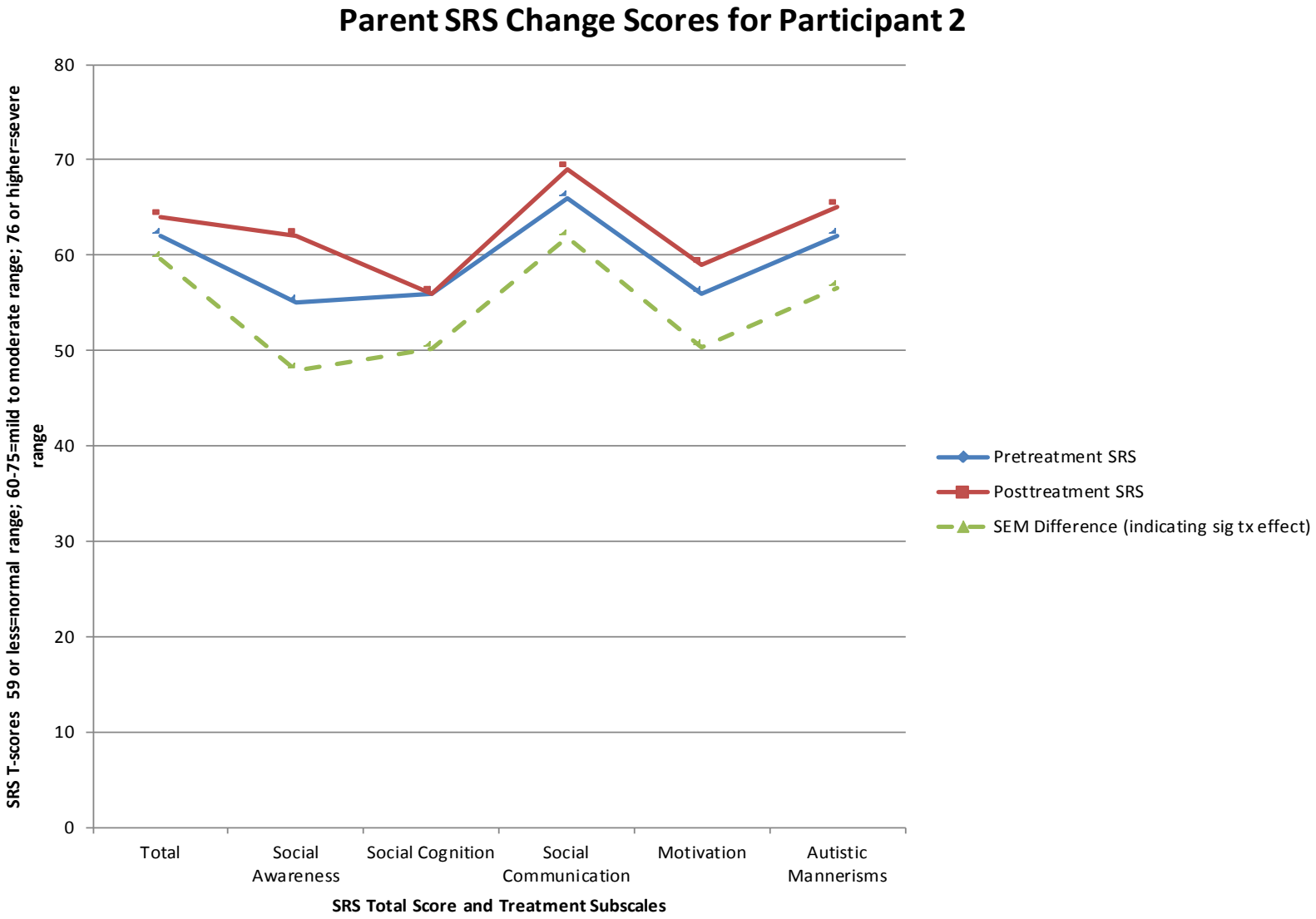

Figure 28. Parent SRS Change Scores for Participant 2

Autistic Mannerisms (pretreatment *T*=63; posttreatment *T*=56). The Social Awareness subscale decreased slightly (pretreatment *T*=65; posttreatment *T*=60). The Social Cognition subscale stayed exactly the same prior to and upon completion of the study (pretreatment *T*=62; posttreatment *T*=62). These scores are displayed graphically in Figure 29.

Participant 3

For Participant 3, the only significant treatment effect obtained on the parent version of the SRS was for Autistic Mannerisms (pretreatment *T*=96; posttreatment *T*=76). The other subscales stayed the same or rose slightly: Social Awareness (pretreatment *T*=78; posttreatment *T*=72), Social Cognition (pretreatment *T*=72; posttreatment *T*=70), Social Communication (pretreatment *T*=64; posttreatment *T*=64), and Social Motivation (pretreatment *T*=61; posttreatment *T*=59). On the teacher version of the SRS, there were significant treatment effects for all five subscales: Social Awareness (pretreatment *T*=67; posttreatment *T*=57), Social Cognition (pretreatment *T*=69, posttreatment *T*=56), Social Communication (pretreatment *T*=61; posttreatment *T*=53), Social Motivation (pretreatment *T*=56; posttreatment *T*=50), and Autistic Mannerisms (pretreatment *T*=66; posttreatment *T*=58). With the exception of the Social Motivation subscale, which was initially in the average range, all other subscales changed from clinical to average ranges on the teacher version of the SRS. These scores are represented graphically in Figures 30 and 31.

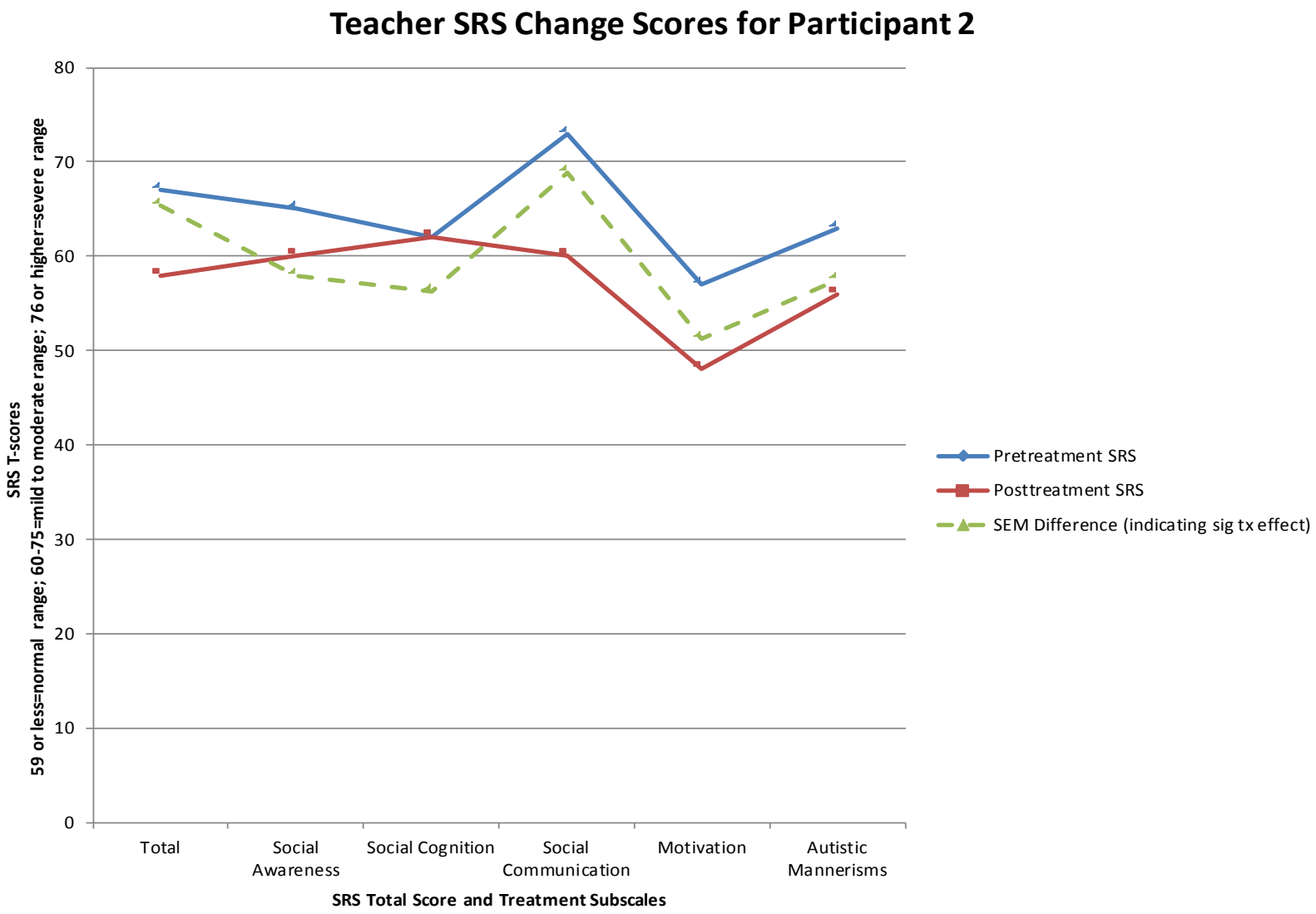

Figure 29. Teacher SRS Change Scores for Participant 2

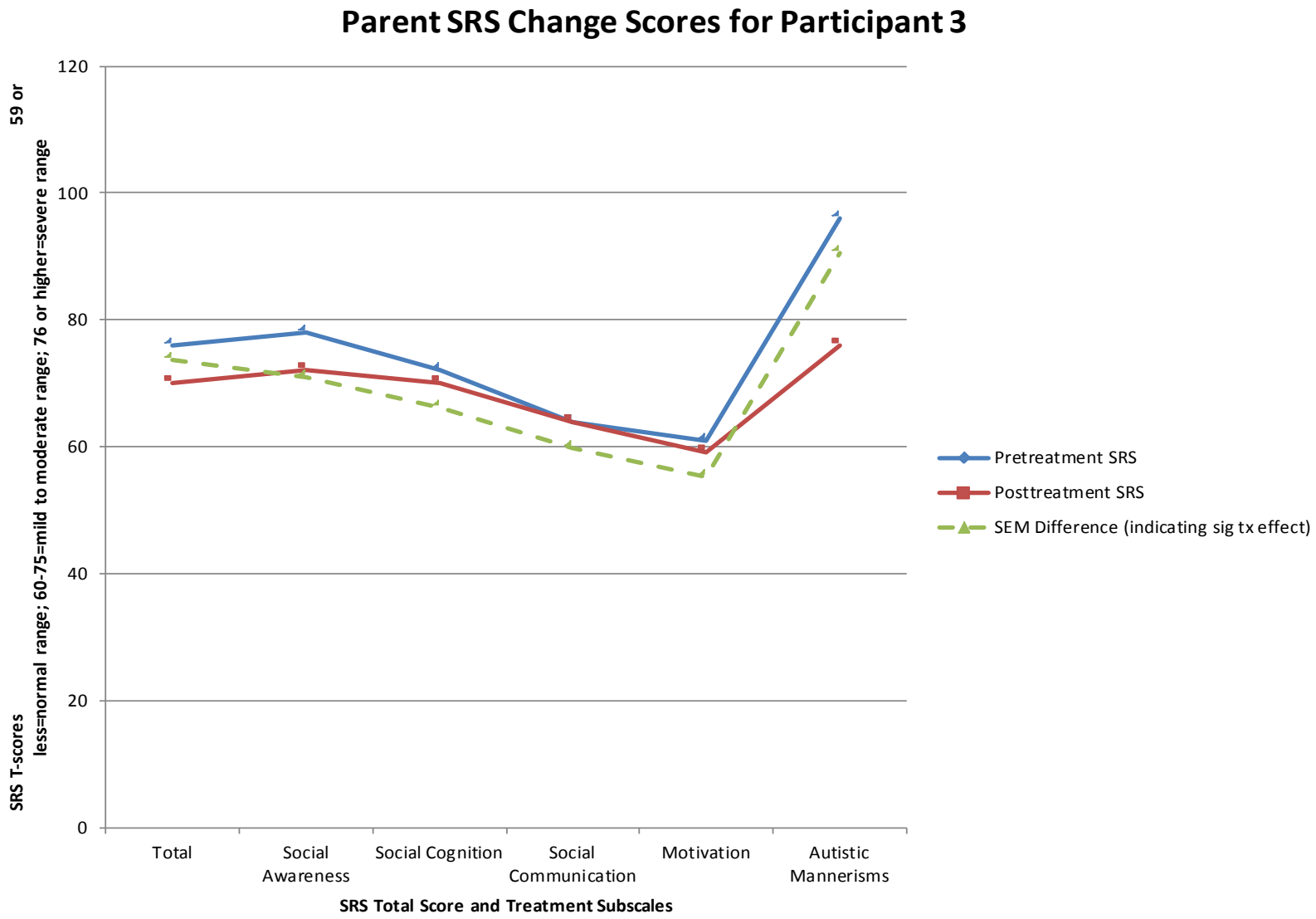

Figure 30. Parent SRS Change Scores for Participant 3

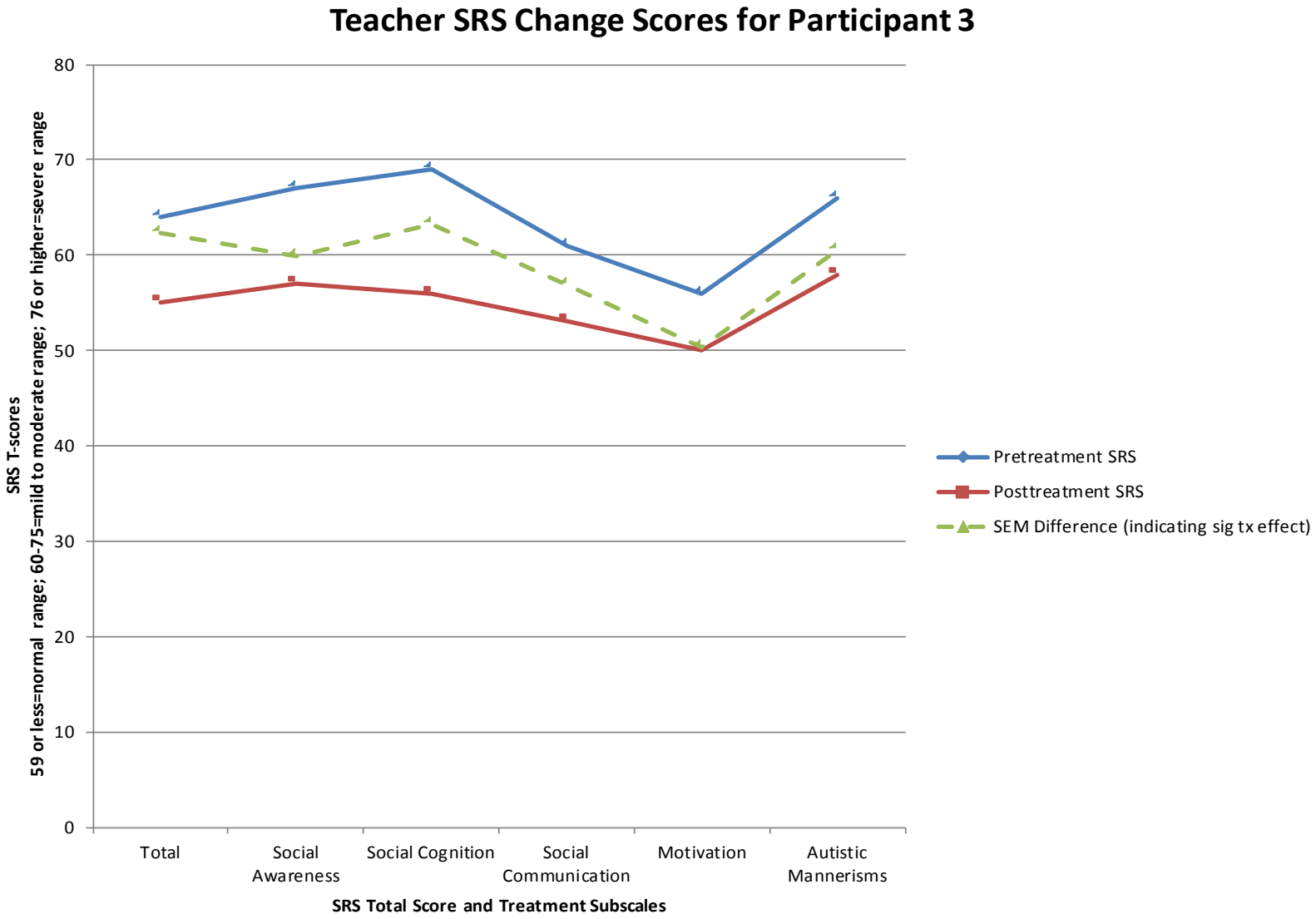

Figure 31. Teacher SRS Change Scores for Participant 3

Participant 4

For Participant 4, the only significant treatment effect obtained on the parent version of the SRS was for Social Awareness (pretreatment *T*=62; posttreatment *T*=52). Social Cognition decreased slightly (pretreatment *T*=65; posttreatment *T*=63). The Social Communication (pretreatment *T*=69; posttreatment *T*=75), Social Motivation (pretreatment *T*=61; posttreatment *T*=63), and Autistic Mannerisms (pretreatment *T*=67; posttreatment *T*=69) subscales increased. These scores are shown graphically in Figure 32. On the teacher version of the SRS, there were not any significant treatment effects. The Social Awareness (pretreatment *T*=48; posttreatment *T*=48) and Social Cognition (pretreatment *T*=56; posttreatment *T*=56) subscales stayed exactly the same. The Social Communication (pretreatment *T*=51; posttreatment *T*=50) and Autistic Mannerisms (pretreatment *T*=51; posttreatment *T*=49) subscales decreased slightly. The Social Motivations subscale increased slightly (pretreatment *T*=50; posttreatment *T*=51). Figure 33 demonstrates these results graphically.

Overall, total SRS pre- and postquantitative change scores, on average, obtained from the parent and teacher versions of the SRS demonstrated that the Superheroes Social Skills for Children with Autism is an effective program. Subscale change scores pre- and posttreatment, on average, also showed that the intervention resulted in positive effects. The exception to this was the Social Communication subscale on the parent version. More substantial effects were seen on the teacher reports. There were individual variations of treatment effects for participants on both the parent and teacher reports. Collected data are sufficient to show that the research question has been satisfied.

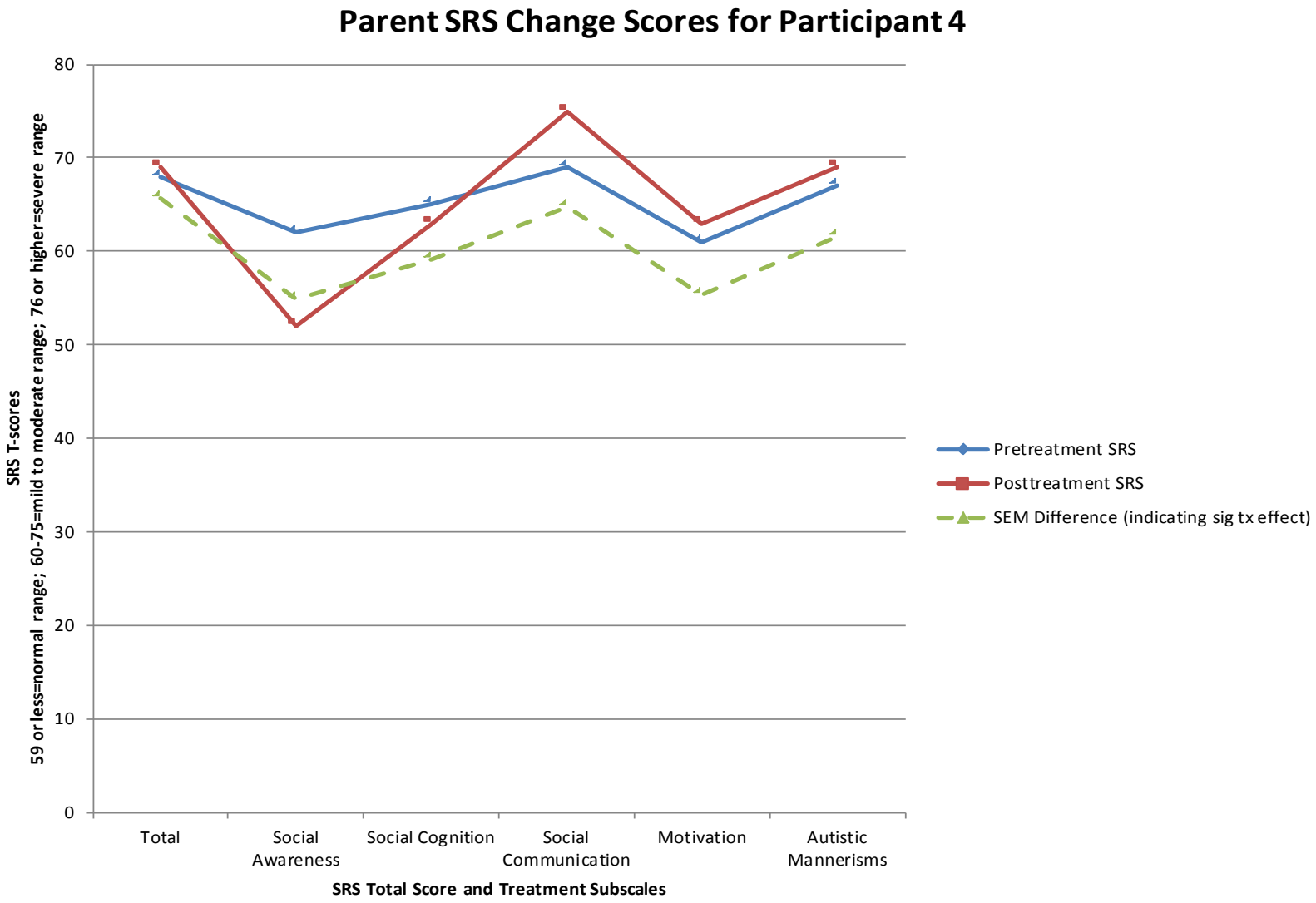

Figure 32. Parent SRS Change Scores for Participant 4

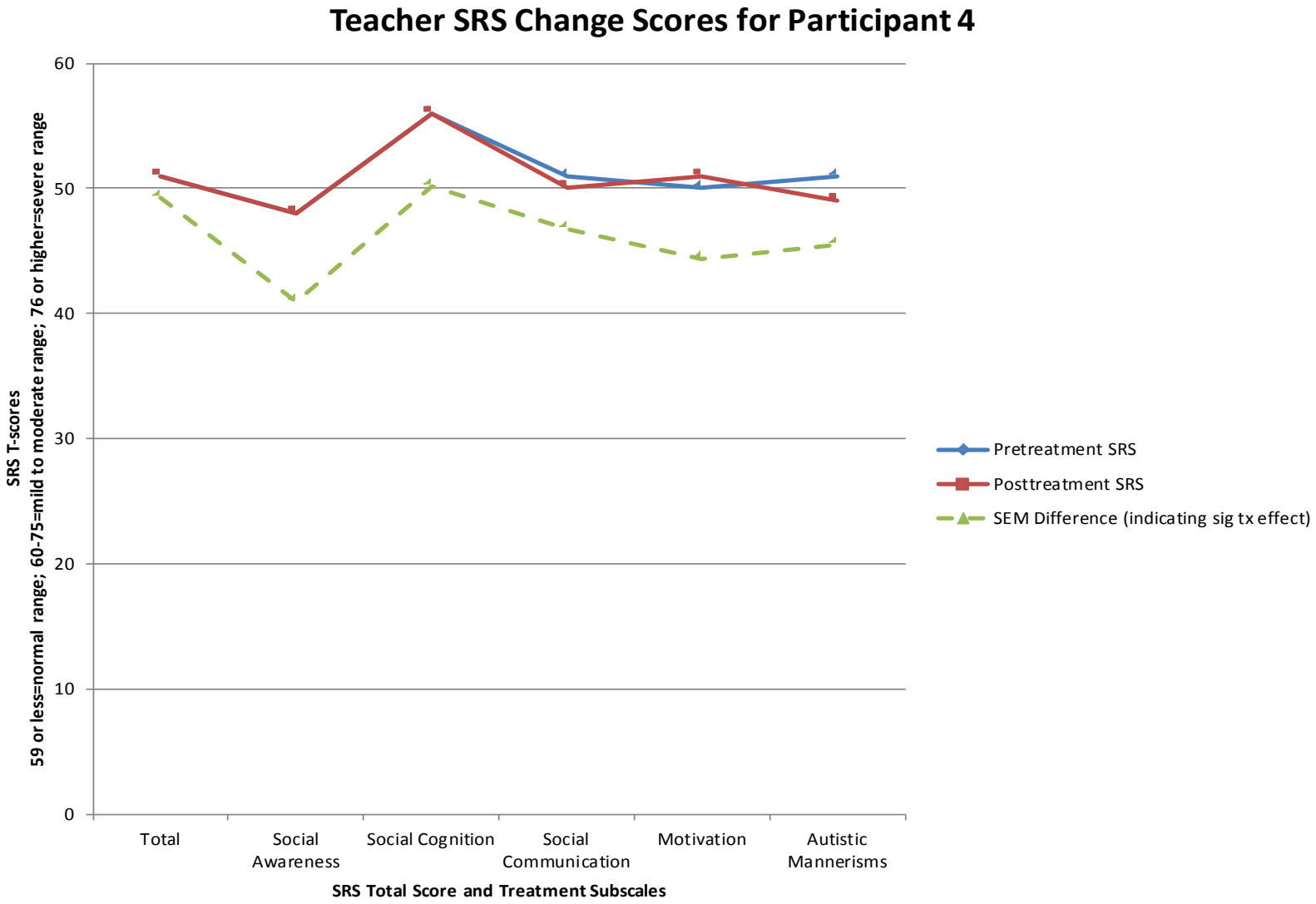

Figure 33. Teacher SRS Change Scores for Participant 4

Research Question #4

4. What is the overall effectiveness of Superheroes Social Skills for Children with Autism, as measured by pre- and postquantitative change scores from parent and teacher versions of the Autism Social Skills Profile?

As with the Social Responsiveness Scale, both parents and teachers completed the ASSP on the 4 participants with autism spectrum disorders, prior to the onset of the study and then again when the program ended. The ASSP uses a Likert scale (i.e., 1 to 4), and some of the questions are reverse scored. Respondents read various statements and then indicated the degree to which the child exhibited the behavior or skill. Higher scores designate better social functioning. In the normative sample, children with ASD without intellectual or severe expressive language difficulties obtained an average score of 109.83, with a range of scores from 70 to 177.

On the parent version of the ASSP, the participants, on average, increased their total social competencies (pre=110, post=120.25). The parents' average pretreatment score very closely matches that found in the standardization sample. Similarly, on the teacher version of the ASSP, participants, also on average, increased their total social competencies (pre=101.25, post=129). There were also subscale increases, on average, on both the parent and teacher versions of the ASSP. Table 13 summarizes graphically the average ASSP Total Score and subscales for the parent and teacher groups. Overall, more significant gains in change scores were found in the teacher ASSP reports. Additionally, the greatest increases seen in subscale change scores were for Participation/Avoidance on the parent ASSP version and for Social Reciprocity on the

Table 13. Mean Total ASSP and Subscale Scores Pre- and Posttreatment

	Total	Social Reciprocity	Participation/ Avoidance	Detrimental Social Behaviors
Pretreatment Parent	110	40.5	24.75	27.25
Posttreatment Parent	120.25	43	30.5	28.5
Pretreatment Teacher	101.25	31.75	25.25	28
Posttreatment Teacher	129	43.5	31.75	33.25

teacher ASSP. Both groups rated the Detrimental Social Behaviors subscale as being the most stable or difficult to change.

Participant 1

For Participant 1, pre- and posttreatment ASSP scores were compared graphically for both the parent (see Figure 34) and teacher (see Figure 35) versions. On the parent ASSP, the Total Score and Social Participation/Avoidance subscale score increased slightly. The Social Reciprocity subscale score stayed the same and the Detrimental Social Behaviors subscale score decreased slightly. More dramatic increases were evident on the teacher ASSP for Participant 1. The ASSP total score and subscale scores all increased, most notably in the Total Score and for the Social Reciprocity subscale.

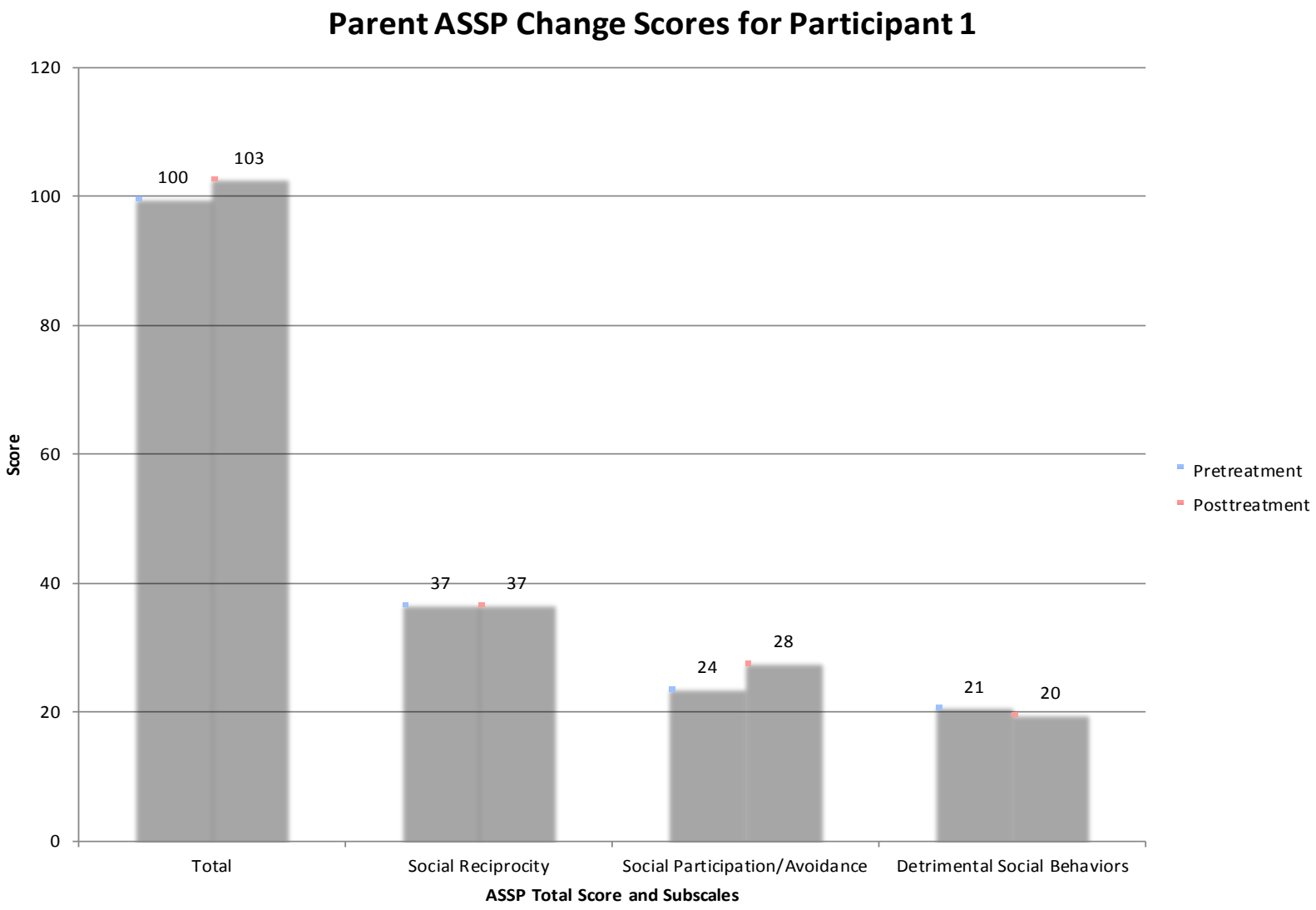

Figure 34. Parent ASSP Change Scores for Participant 1

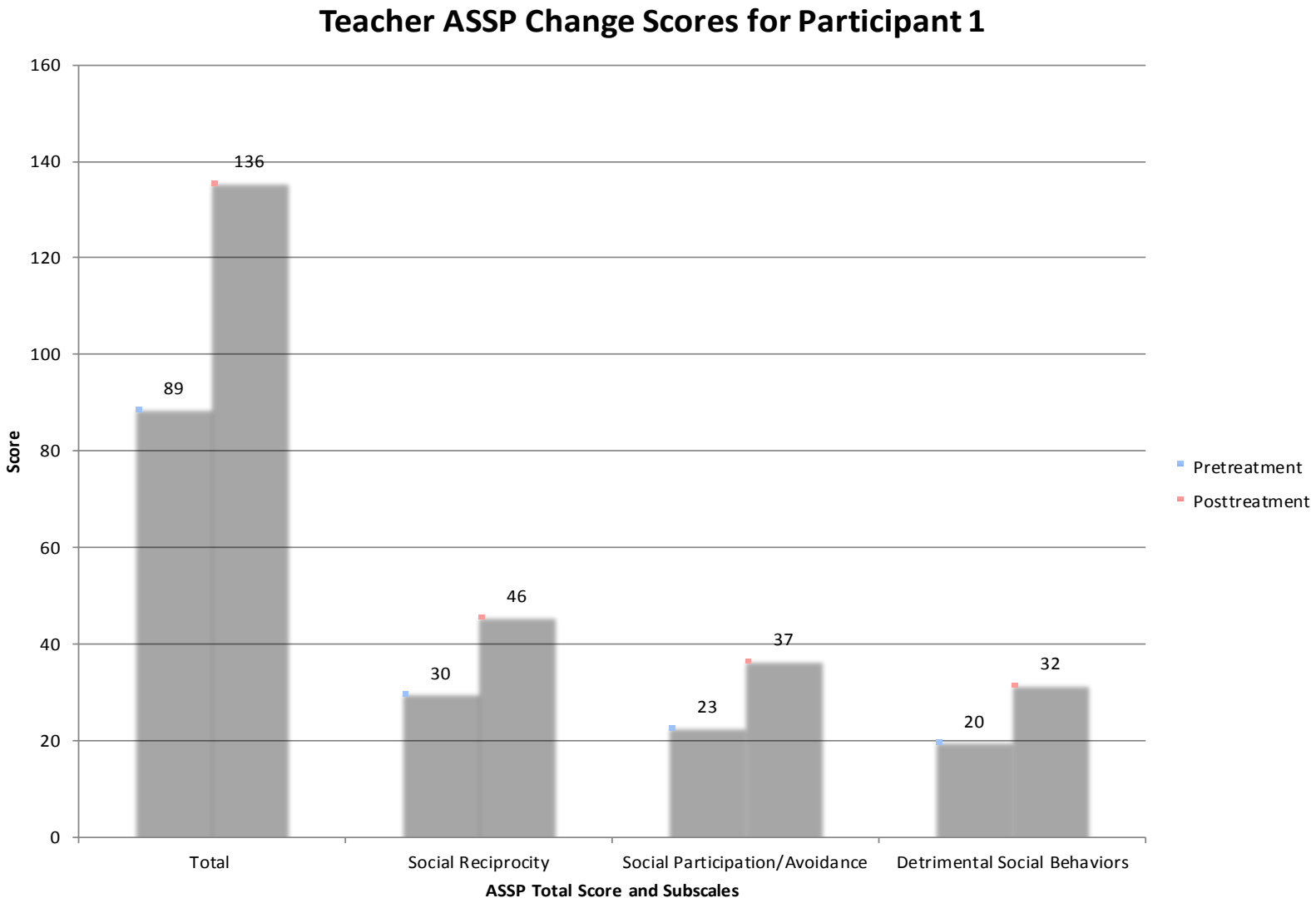

Figure 35. Teacher ASSP Change Scores for Participant 1

Participant 2

Parent and teacher ASSP scores were also compared graphically for Participant 2 (Figures 36 and 37). On the parent version, the total score and the Social Reciprocity subscale increased slightly, the Social Participation/Avoidance subscale decreased slightly, and the Detrimental Social Behaviors subscale stayed the same pre- and posttreatment. All scores on the teacher version increased. Consistent with Participant 1, the greatest increases were evident on the Total Score and Social Reciprocity subscale.

Participant 3

For Participant 3, all of the ASSP scores increased from pre- to posttreatment on the parent version (see Figure 38). The Total Score and the Social Participation/ Avoidance subscales had the greatest gains. Similarly, the Total Score and subscales also increased on the teacher ASSP (see Figure 39). The Total Score and Detrimental Social Behaviors subscale showed the greatest changes.

Participant 4

For Participant 4, pre- and posttreatment ASSP scores were compared graphically for both the parent (see Figure 40) and teacher (see Figure 41) versions. On the parent ASSP, the Total Score and both the Social Reciprocity and Detrimental Social Behaviors subscales increased slightly. The score on the Social Participation/Avoidance subscale stayed consistent. All of the scores on the teacher ASSP, except the Detrimental Social Behaviors subscale increased pre- to posttreatment. The most substantial changes were seen in the Total Score and Social Reciprocity subscale.

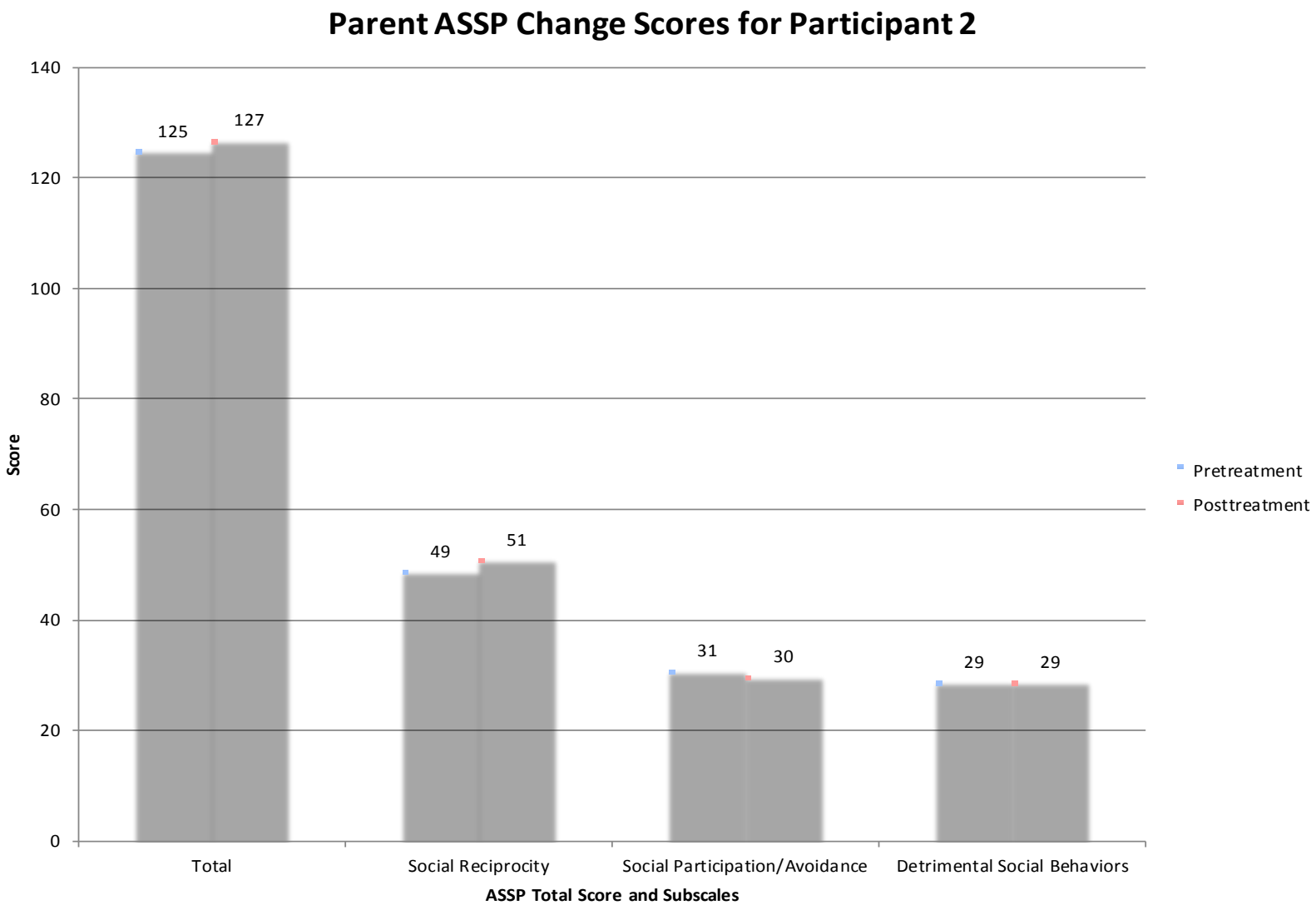

Figure 36. Parent ASSP Change Scores for Participant 2

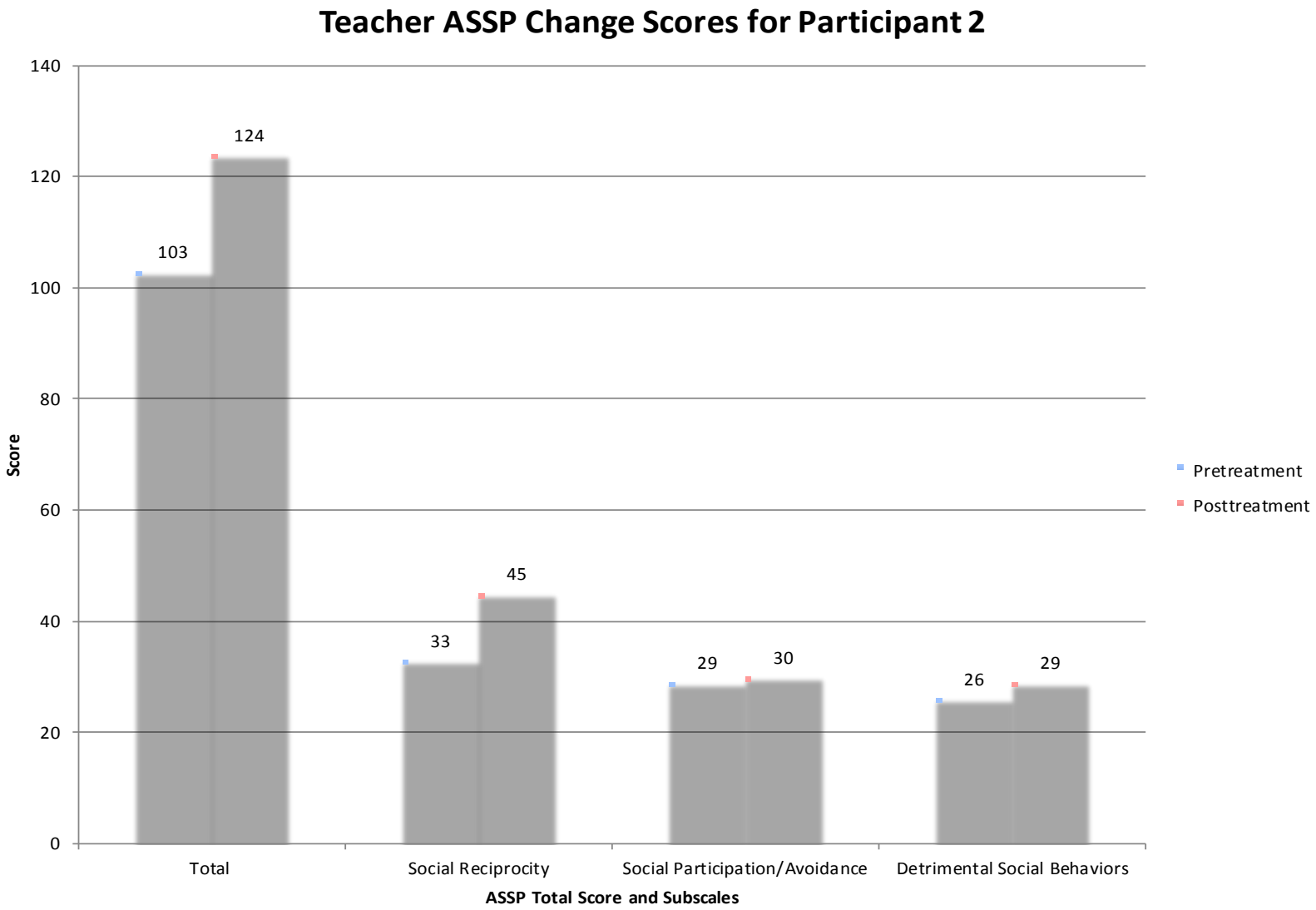

Figure 37. Teacher ASSP Change Scores for Participant 2

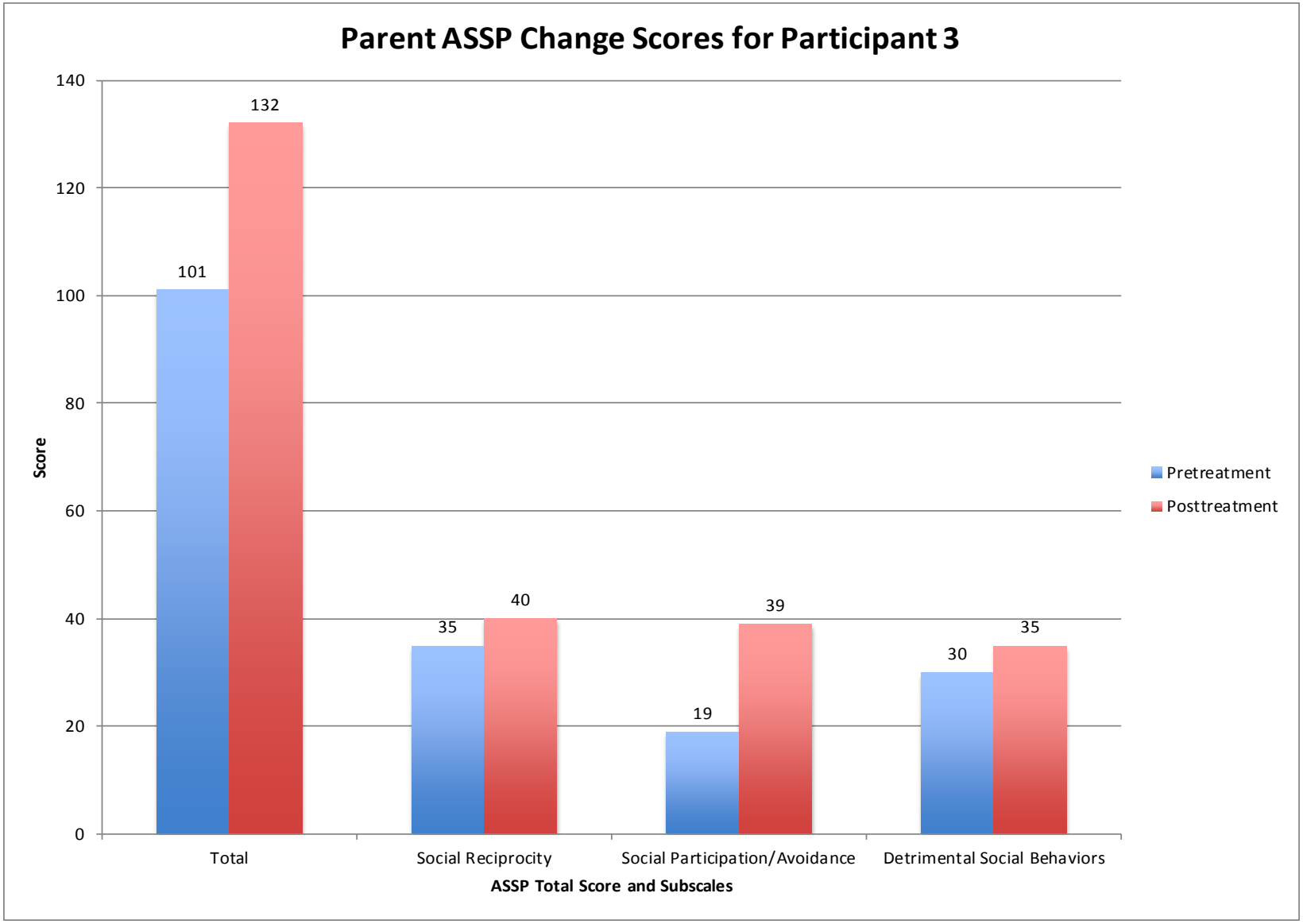

Figure 38. Parent ASSP Change Scores for Participant 3

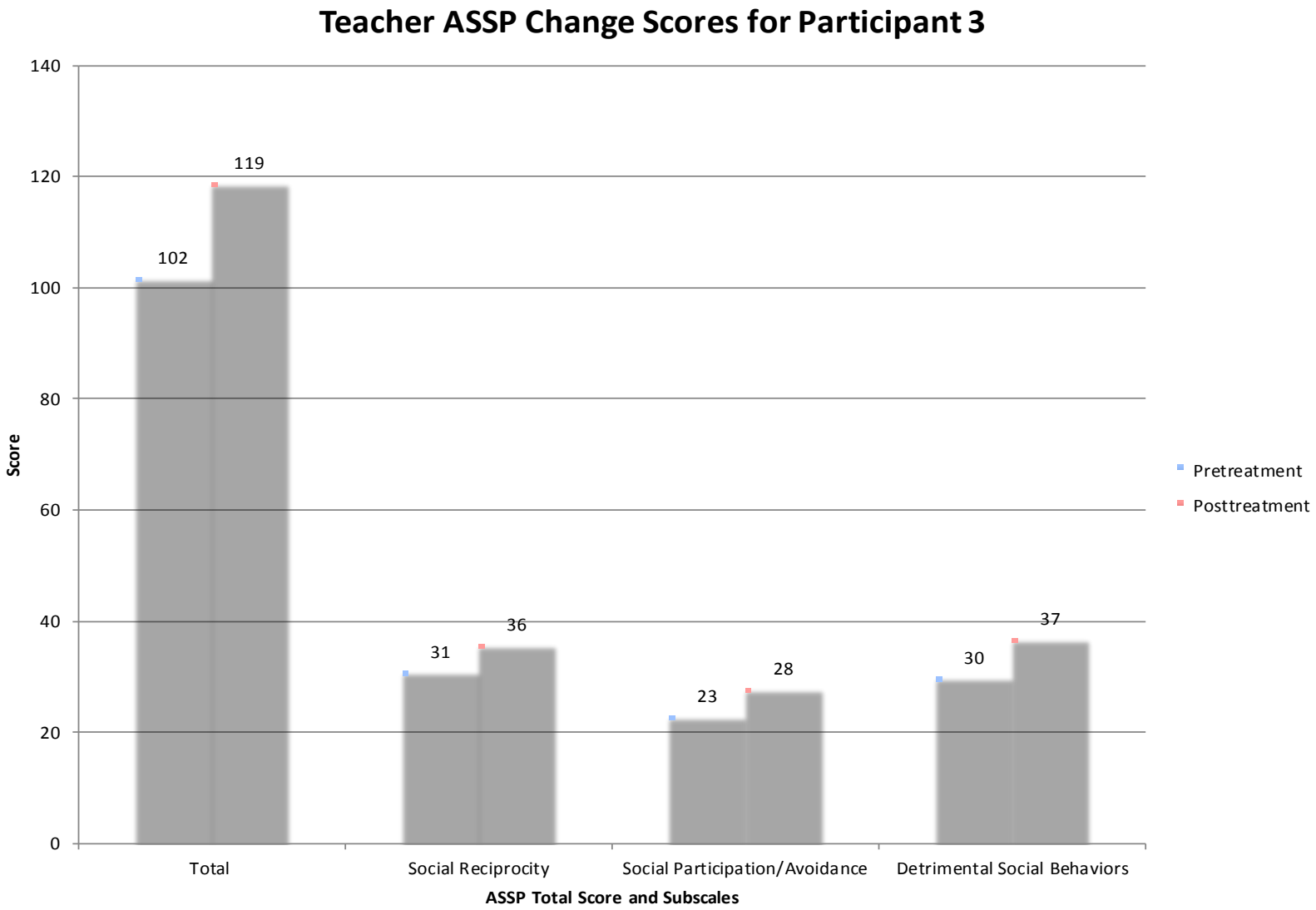

Figure 39. Teacher ASSP Change Scores for Participant 3

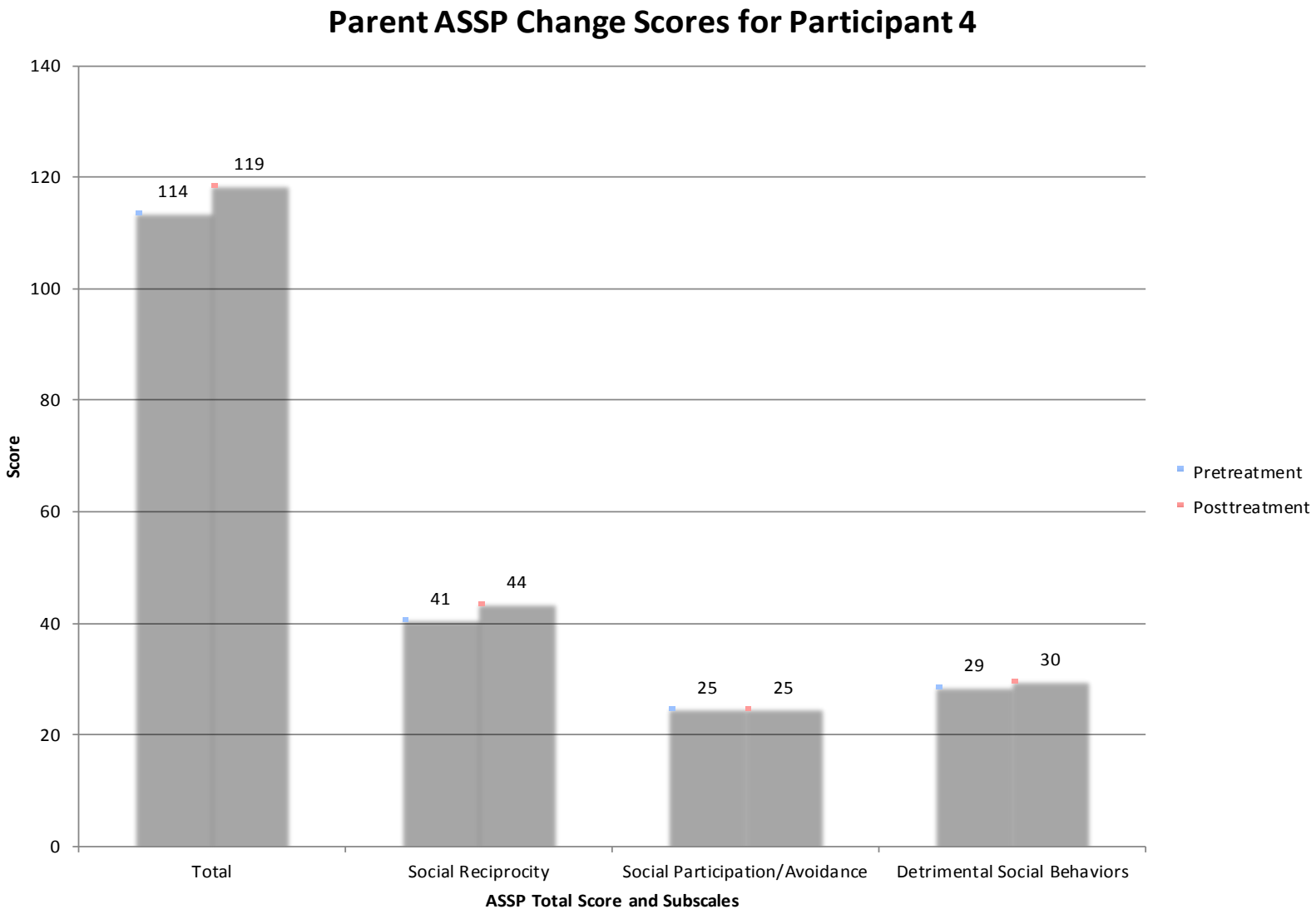

Figure 40. Parent ASSP Change Scores for Participant 4

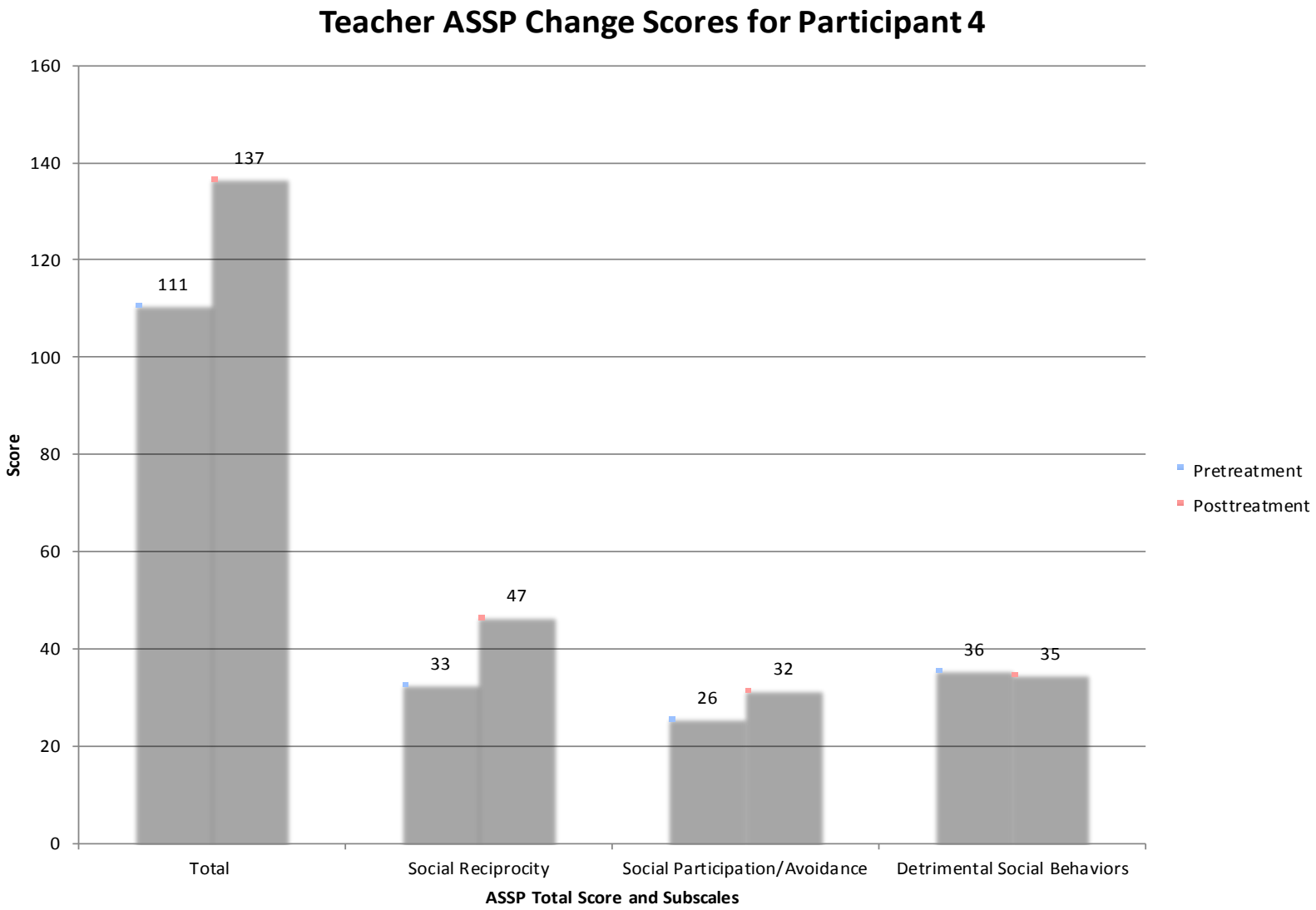

Figure 41. Teacher ASSP Change Scores for Participant 4

Overall, total pre- and postquantitative change scores, on average, obtained from the parent and teacher versions of the ASSP demonstrated that the Superheroes Social Skills for Children with Autism produces favorable results. Subscale change scores pre- and posttreatment, on average, also showed that the intervention was efficacious. Greater effects were seen on the teacher reports. There were individual variations of treatment effects for participants on both the parent and teacher reports. This research question has been satisfied with the data collected.

Research Question #5

5. What is the correlation between the number of "Power Charges" obtained on a self-recording instrument assessing different specific social skills, the number of Scooter Cards, and the number of Black Hole cards participants earn with the percentage of social interactions displayed during the analog free play period?

The percentage of total social engagement for each participant with ASD was calculated for one session per week during the analog free play period. This percentage was compared to the number of Power Charges earned on the participant's Power Card for that corresponding session. Similarly, the percentage of social engagement was also compared with the number of Scooter and Black Hole cards the participant obtained. It was not possible to calculate a Pearson's Correlation Coefficient for Black Hole cards and total social engagement for Participant 2 and Participant 3 because they did not obtain Black Hole cards for any of the sessions that had an analog free play period.

Overall results, when all 4 participants' data were combined, showed that there was not a statistically significant correlation between Power Charges received and total social engagement, $r\,(37) = 0.18$, $p>0.05$. There was no statistically significant

relationship between Scooter cards accrued and total social engagement, r (37) = 0.99, p>0.05, nor was there a significant correlation between Black Hole cards obtained and total social engagement, r (37) = -0.29, p>0.05. Table 14 summarizes these results.

For Participant 1, there were no statistically significant relationships found between Power Charges and total social engagement, r (8) = -0.01, p>0.05, Scooter Cards and total social engagement r (8) = -0.05, p>0.05, or Black Hole Cards and total social engagement r (8) = -0.17, p>0.05. In fact, there were slightly negative correlations for all three of these variables.

There was not a statistically significant correlation between the number of Power Charges obtained and total social engagement for Participant 2, r (9) = 0.37, p<0.05. However, according to Cohen (1988), this could be interpreted as a small correlation. There was not a significant relationship between Scooter cards and total social engagement, r (9) = 0.09, p>0.05.

For Participant 3, there was not a statistically significant correlation between the number of Scooter cards accrued and total social engagement, r (7) = 0.65, p>0.05. However, according to Cohen (1988), this could be interpreted as a moderate correlation. There also was not a significant relationship between Power Charges cards and total social engagement, r (7) = -0.2, p>0.05.

There were no statistically significant correlations for Participant 4 between the number of Power Charges obtained and total social engagement, r (7) = -0.24, p>0.05, Scooter cards and social engagement, r (7) = -0.24, p>0.05, or Black Hole cards and social engagement, r (7) = -0.15. These results all represent negative associations.

Table 14. Pearson's *r* Correlations Between Total Social Engagement and Power Charges, Scooter Cards and Black Hole Cards

	Power Charges		Scooter Cards		Black Hole Cards	
	r	*p*	*r*	*p*	*r*	*p*
Participant 1	-0.01	0.97	-0.05	0.89	-0.17	0.64
Participant 2	0.37	0.26	0.09	0.80	N/A	N/A
Participant 3	-0.20	0.61	0.65	0.06	N/A	N/A
Participant 4	-0.24	0.54	-0.24	0.53	-0.15	0.7
Total	0.18	0.28	0	0.99	-0.29	0.08

Overall results indicated that there were no relationships established between total social engagement and Power Charges, Scooter cards, and Black Hole cards obtained by the participants. Collected data sufficiently answer the research question.

Research Question #6

6. What is the improvement in following group rules during the social skills training sessions, as indicated by comparing the average number of Scooter and Black Hole cards earned during each session from ASD and typically developing participants?

There was no observed pattern that indicated a clear trajectory for group rule following behaviors during the implementation of Superheroes Social Skills for Children with Autism (see Figures 42, 43, and 44). On average, participants in the ASD group received less than one Black Hole card a session. Participants in the typical peer group did not ever receive Black Hole cards. There were no Black Hole cards distributed between sessions 12 through 19. This indicates that participants' behavior at that point

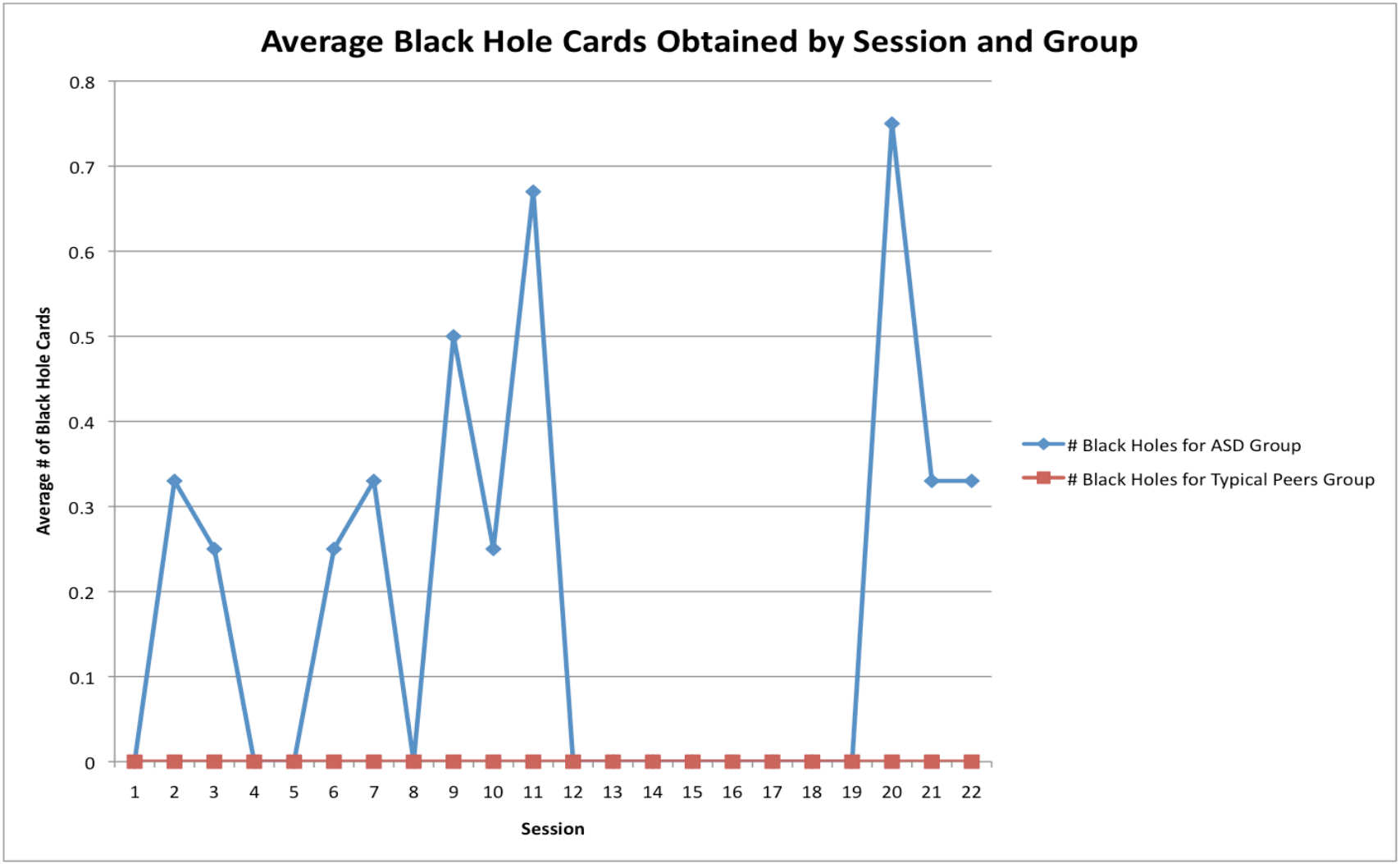

Figure 42. Average Black Hole Cards Obtained by Session and Group

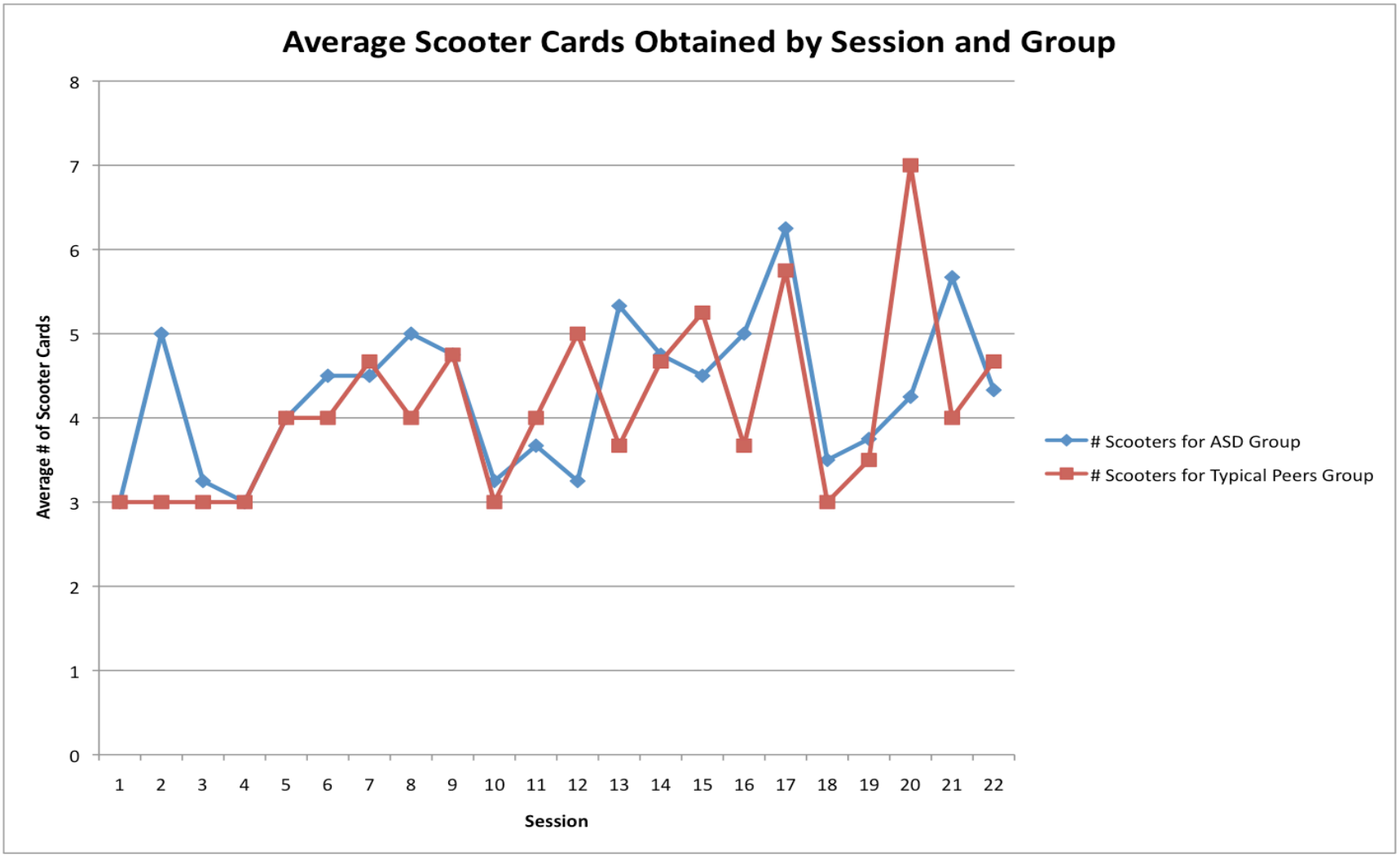

Figure 43. Average Scooter Cards Obtained by Session and Group

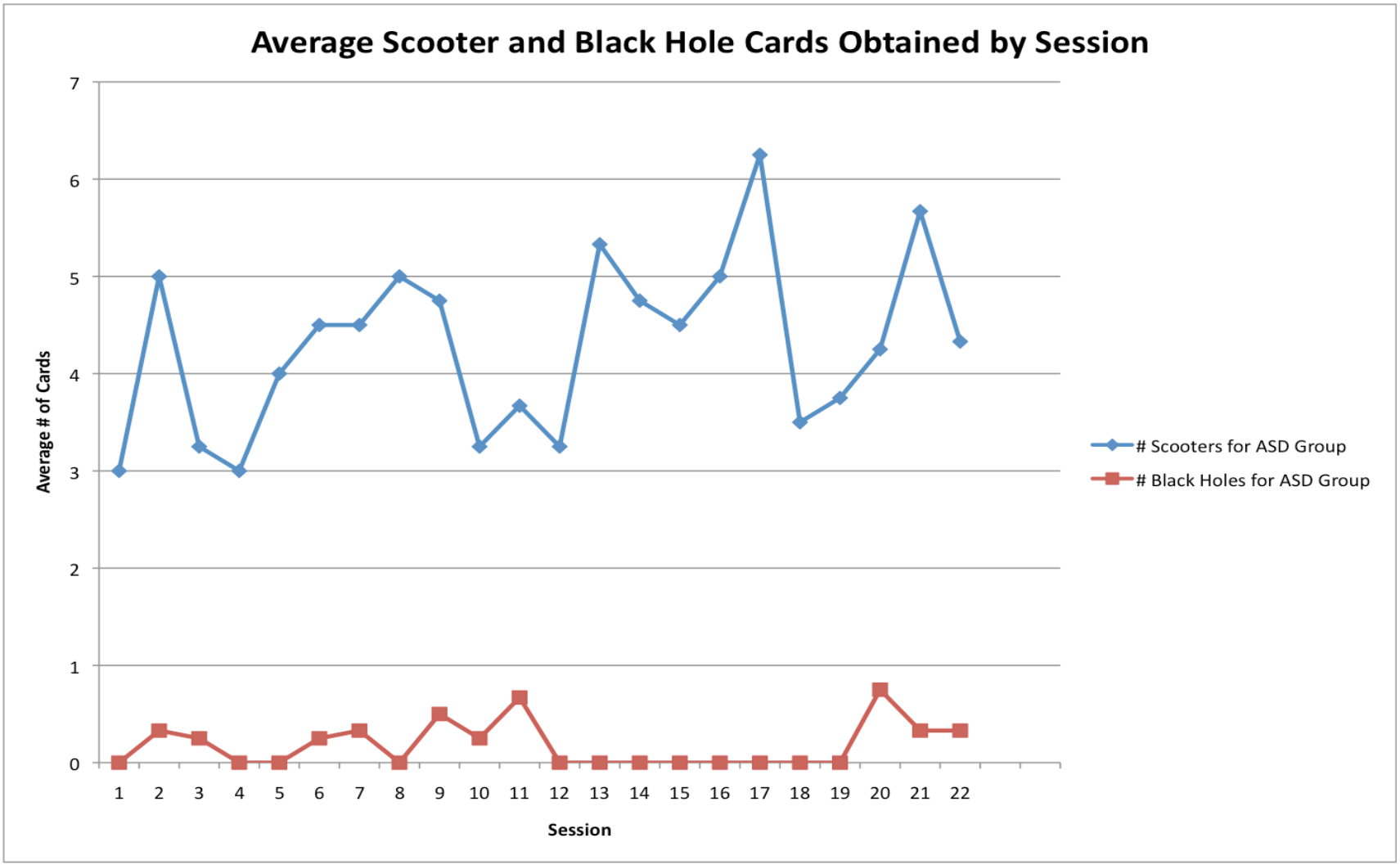

Figure 44. Average Scooter and Black Hole Cards Obtained by Session

was well shaped to following the rules. However, toward the end of the study, it was necessary to again distribute Black Hole cards for rule violations, although this was still less than one Black Hole card a session, on average. Both groups received between three and seven Scooter cards per session, on average.

Overall results showed that there is no clear pattern of improvement in rule-following behaviors and the number of Black Hole and Scooter cards participants received. Collected data sufficiently satisfy the research question.

Research Question #7

7. What is the consumer satisfaction of Superheroes Social Skills for Children with Autism, as reported by parents and teachers on the Behavior Intervention Rating Scale?

The teachers of the participants with ASD, as well as parents of both the participants with ASD and the typically developing peers that acted as "peer buddies" during implementation of the social skills program completed the BIRS upon completion of the study. This instrument employs a Likert scale, with a 1 (i.e., "strongly disagree") representing a least favorable opinion and a 6 (i.e., "strongly agree") representing the most favorable opinion. Data were collected from all four teachers and all eight parents who participated in the study.

Overall, parents and teachers rated the Superheroes Social Skills for Children with Autism program very favorably (M=5.11) on the BIRS, with most responses to items falling in the range, on average, of "strongly agree" or "agree" (see Table 15). Highest average ratings were for statements such as "Superheroes Social Skills would be an acceptable intervention to improve social skills," "Most parents/teachers would find

Table 15. Mean BIRS Results

Item	Teacher Mean	ASD Parents Mean	Typical Peers Parents Mean	Total Mean
1. Superheroes Social Skills would be an acceptable intervention to improve social skills.	6	5.25	5.25	5.5
2. Most parents/teachers would find Superheroes Social Skills appropriate for social skills intervention.	6	5.25	5.25	5.5
3. Superheroes Social Skills should prove effective in targeting social skills.	6	5.25	5.25	5.5
4. I would suggest the use of Superheroes Social Skills to other parents/teachers.	6	5	5.25	5.42
5. Poor social skills in my child/student are severe enough to warrant use of Superheroes Social Skills.	4.5	5.5	1.5	3.83
6. Most parents would find Superheroes Social Skills suitable in targeting social skills.	5.75	5.25	5.25	5.42
7. I would be willing to use Superheroes Social Skills in my home/classroom.	5.5	5.25	5.25	5.33
8. Superheroes Social Skills would not result in negative side effects for the child.	6	5	5.5	5.5
9. Superheroes Social Skills would be an appropriate intervention for a variety of children.	5.5	4.75	5.25	5.17
10. Superheroes Social Skills is consistent with other social skills programs I have used.	5.25	4.67	5.5	5.11
11. Superheroes Social Skills is a fair way to teach social skills.	6	4.75	5.25	5.33
12. Superheroes Social Skills is reasonable for difficulties that arise from social skills.	5.75	4.75	5.25	5.25
13. I like the procedures used in Superheroes Social Skills.	5.75	5.25	5.25	5.42
14. Superheroes Social Skills is a good way to handle social skills at home.	5.75	5	5	5.25

Table 15. Continued

Item	Teacher Mean	ASD Parents Mean	Typical Peers Parents Mean	Total Mean
15. Overall, Superheroes Social Skills would be beneficial for my child.	5.75	5	4.75	5.17
16. Superheroes Social Skills would quickly improve a child's behavior.	5.75	4.25	4.75	4.92
17. Superheroes Social Skills would produce a lasting improvement in a child's behavior.	5.75	4.25	4.75	4.92
18. Superheroes Social Skills would improve a child's behavior to the point that it would not noticeably deviate from other peer's behavior.	5.25	3.25	5	4.45
19. Soon after using Superheroes Social Skills, parents would notice a positive change in social skills.	6	4.25	5	5.08
20. The child's behavior will remain at an improved level even after Superheroes Social Skills is discontinued.	5.25	4.50	4	4.58
21. Using Superheroes Social Skills should not only improve the child's behavior in the home/classroom, but also in other settings.	6	5.25	5	5.42
22. When comparing a participant with a non-participating peer before and after use of Superheroes Social Skills, the participant's and the peer's behavior would be more alike after using Superheroes Social Skills.	5.75	4.33	5	5.10
23. Superheroes Social Skills should produce enough improvement in social skills so the behavior is no longer a problem.	5.25	3.75	4.5	4.5
24. Other behaviors related to social skills also are likely to be improved by Superheroes Social Skills.	6	4.25	5	5.08
Overall Mean Score for all Questions	5.69	4.75	4.91	5.11

Superheroes Social Skills appropriate for social skills intervention," "Superheroes Social Skills should prove effective in targeting social skills," and "Superheroes Social Skills would not result in negative side effects for the child." The lowest rating, on average, was for the statement, "Poor social skills in my child/student are severe enough to warrant use of Superheroes Social Skills," which is justified given that the parents of the typically developing peers were included in the overall group.

The parents of the children with ASD were generally satisfied with the Superheroes Social Skills for Children with Autism program, on average (M=4.75). The highest score was for the item, "Poor social skills in my child/student are severe enough to warrant use of Superheroes Social Skills." The lowest scores were for the items, "Superheroes Social Skills would improve a child's behavior to the point that it would not noticeably deviate from other peer's behavior," and "Superheroes Social Skills should produce enough improvement in social skills so the behavior is no longer a problem" (see Table 15). Although the parents saw marked improvements in their children's social skills, they felt that the intervention did not eliminate all social deficits.

The BIRS results (M=4.91) also demonstrated that the parents of the typically developing children also were satisfied with the program (see Table 15). In fact, their average ratings were slightly higher than the parents of the children with ASD. The most favorable statements were that Superheroes Social Skills is consistent with other social skills programs and would not result in negative effects. The least favorable item was that their child's poor social skills necessitated use of the program. This result is consistent with the fact that the typically developing children were not nominated to be

part of the group because they lacked appropriate social skills, rather because they could serve as positive role models to the children with ASD.

On average, the BIRS data demonstrated that teachers were very satisfied with the Superheroes Social Skills for Children with Autism program (*M*=5.69) (see Table 15). Teachers had the highest ratings of all groups, on average. Some of the most favorable statements (all rated an average score of 6) endorsed by teachers were that the program would be an acceptable, fair, appropriate, and effective intervention to improve social skills, result in noticeable changes including behaviors not limited to social skills, gains would generalize to multiple settings, and that there would be no adverse program side effects. Teachers agreed that they would recommend the program to others. The least favorable item (rated an average score of 4.5) was that students' social skills were severe enough to warrant use of the Superheroes program.

Overall, teachers and parents of both the children with ASD and typically developing peers serving as "peer buddies" in Superheroes Social Skills for Children with Autism were very satisfied with the program. The data collected are sufficient to satisfy the research question.

Research Question #8

8. What is the social validity of Superheroes Social Skills for Children with Autism, as measured by teacher and parent report on an adapted social validity scale (Bellini, 2007)?

All eight parents (i.e., parents of the children with ASD as well as parents of the typically developing children) completed an adapted social validity scale upon completion of the program. Additionally, five teachers also completed the measure.

Participant 4's Functional Skills teacher, as well as his 2nd grade teacher completed the adapted scale. This was the only measure the Functional Skills teacher completed during the study and she took it upon herself to ask to complete it. All of the other teachers were regular education teachers and were the same teachers who completed the SRS, ASSP, and BIRS. On the adapted social validity scale, respondents read various statements and rated how well they agreed to each one through usage of a Likert scale system, with a 1 answer signifying "strongly disagree" and a 4 response indicating "strongly agree." The first two questions were reverse scored. Higher answers represent more social acceptance of the program.

The results of the adapted scale indicate that, overall, both parents and teachers endorsed substantial social validity for the Superheroes Social Skills for Children with Autism program (*M*=3.58) (see Table 16). Some of the highest average ratings were for statements that the intervention was not distracting to other students and that the children enjoyed being part of the intervention. The lowest average ratings, although still rated very high comparatively (i.e., *M*=3.38) on the Likert scale, were that the children enjoyed the "Power Card" and that the school/home component was easy to implement. Parents and teachers reported that, on average, children liked watching the videos best (*M*=3.62).

The parents of the children with ASD indicated high social validity, on average, for the Superheroes Social Skills for Children with Autism program (*M*=3.39). This pattern was consistent with the parents of the typically developing children who participated, although their ratings were slightly higher, on average (*M*=3.53). Some of the highest endorsed items, on average, for both parent groups were that the intervention was not distracting, children enjoyed participating and watching the videos, and that the

Table 16. Mean Social Validity Scale Results

Item	Teacher Mean	ASD Parents Mean	Typical Peers Parents Mean	Total Mean
1. The intervention has interfered with my child/student's normal classroom activity.	3.8	3.25	3.5	3.54
2. The intervention is distracting to the other students.	3.6	4	3.75	3.77
3. My child/student enjoys watching the videos.	3.8	3.25	3.75	3.62
4. My child/student enjoys reading the comic books.	3.8	3	3.5	3.46
5. My child/student enjoys the Superheroes power cards.	3.4	3.5	3.25	3.38
6. The school/home component of the intervention is easy to implement.	3.6	3.25	3.25	3.38
7. I believe the intervention is beneficial to my child/student.	4	3.25	3.5	3.62
8. My child/student enjoyed being part of this intervention.	4	3.5	3.75	3.77
9. I enjoyed being part of this intervention.	4	3.5	3.5	3.69
Overall Mean Score for all Questions	3.78	3.39	3.53	3.58

parents enjoyed being part of the intervention. One of the typical peer's parent commented, "She loved going to this class. Thanks for letting her participate!"

Teachers had the highest ratings on the adapted social validity scale, on average (*M*=3.78). The most highly endorsed items were that they felt the intervention was beneficial, the students enjoyed participating, and the teachers themselves enjoyed being part of the intervention. The item with the lowest average score (*M*=3.4) was "My student enjoys the Superheroes power cards."

Many of the teachers also provided qualitative remarks at the bottom of the social validity form. Most of these included comments on the changes they saw in their students during their involvement in the program. For example, the third grade teacher noted, "I noticed a big difference in him and his desire to express himself more…. The skills I noticed the most include using a shoulder tap to get attention, not interrupting during a conversation, giving compliments, making eye contact when talking, raising his hand when contributing to class discussion, and asking for help when he needed it." The fourth grade teacher stated, "He is much more socially interactive on the playground and I credit this intervention to his progress!" The Functional Skills teacher added, "He has made great gains by learning some appropriate social skills steps and I have seen him use these on the playground." Another teacher explained a strategy that she found helpful to include in the classroom to make the intervention more successful, "We taped the 'Power Card' to his desk to help me remember to look for the skills that were being worked on."

Overall, teachers and parents of both the children with ASD and typically developing peers serving as "peer buddies" rated the Superheroes Social Skills for Children with Autism program as being socially valid. Collected data are sufficient to satisfy the research question.

Research Question #9

9. What is the consumer satisfaction of Superheroes Social Skills for Children with Autism, as reported by both ASD and typical peer study participants on a study-derived Child Consumer Satisfaction Scale?

The participants with ASD as well as the typically developing "peer buddy" participants completed the Child Consumer Satisfaction Survey (CCSS) at the end of the

Superheroes Social Skills for Children with Autism program. Data were obtained for all 8 participants. The CCSS measure was developed by the authors of Superheroes Social Skills and uses a 1- through 4-point Likert scale so that consumers can indicate how well they liked the program. A 1 response indicates that participants "strongly disagree" with a CCSS item, while a 4 response indicates that participants "strongly agree" with an item. The first statement in the measure, "Superheroes Social Skills has interfered with my other classes," was reverse scored. Higher scores reflect better consumer satisfaction.

The results of the CCSS, overall, showed that the participants were satisfied with the Superheroes Social Skills for Children with Autism (M=3.28) (see Table 17). The highest rankings, on average, included "Superheroes Social Skills has helped me learn how to make friends," and "I believe Superheroes Social Skills has helped me." The lowest endorsed item, on average, was "Superheroes Social Skills has not interfered with my other classes." When the groups were separated, there were some differences in responses. For example, ASD participants remarked that their least favorite component of the program, on average, was the Power Cards. For the typically developing peers, on average, their least favorite element was the comic books. Both groups really enjoyed participating and that they felt the topics discussed were important.

Overall, the study-derived Child Consumer Satisfaction Survey results demonstrate that all of the children participating in Superheroes Social Skills for Children with Autism were satisfied with the program. This research question has been satisfied with the data collected.

Table 17. Mean Child Consumer Satisfaction Scale Results

Item	ASD Group Mean	Typical Peers Group Mean	Total Mean
1. Superheroes Social Skills has not interfered with my other classes.	2.75	3.25	3
2. Superheroes Social Skills has helped me learn how to make friends.	3.5	3.25	3.38
3. I liked watching the videos.	3.25	3.25	3.25
4. I liked reading the comic books.	3.25	3	3.13
5. I liked the Superheroes Social Skills power cards.	3	3.25	3.13
6. I believe Superheroes Social Skills has helped me.	3.5	3.25	3.38
7. I enjoyed participating in Superheroes Social Skills.	3.5	3.5	3.5
8. The things we talked about in the lessons are important.	3.5	3.5	3.5
9. I would like the Superheroes to teach me more.	3.25	3.25	3.25
Overall Mean Score for all Questions	3.28	3.28	3.28

CHAPTER 4

DISCUSSION

The current study investigated the effectiveness of the Superheroes Social Skills for Children with Autism program in increasing the social engagement skills of children with an ASD. This social skills program was implemented in a suburban elementary public school, located in the greater metropolitan area of Salt Lake City, Utah. Subjects included 4 children with ASD between the ages of 8 and 9. Participants had to meet strict inclusion criteria, such as having a verbal IQ score above 69, possessing appropriate receptive and expressive language skills as to participate in the program, and having either a clinical or educational diagnosis of an ASD given by a qualified examiner. Diagnosis of an ASD was confirmed primarily with the ADOS, and secondly through the administration of the GADS and SRS. Four typically developing peers, nominated by their teachers, also participated in the program and acted as "peer buddies" to the children with ASD during the social skills training.

Prior to the onset of the intervention, parents and teachers attended a training that outlined the Superheroes Social Skills program and its key components. Appropriate informed consent forms were obtained. Both the parents and teachers of the children with ASD also completed several questionnaires (e.g., placement checklist, GADS, SRS, and ASSP). The placement checklist was used as a screening tool and also to gather important behavioral, language, and social information about each participant. As

mentioned above, the GADS and SRS served to assist in confirming an ASD diagnosis. The SRS and ASSP were used as pretreatment measures of the participants' social skills and were compared to a second set of questionnaires collected from the parents and teachers at the conclusion of the study.

During the baseline phase of the study, the participants with ASD were observed during 10-minute analog free play and recess sessions. In the analog free play period, both the participants with ASD and the typically developing peers had access to the same set of six toys, namely games, Legos, Transformers, and cars that could be used either interactively or solitary. During recess, the children with ASD were able to play on various playground structures, in a field, on a track, or on a blacktop area where there were basketball hoops, a wall ball, and tether balls. The observations were filmed and later coded. Specifically, each participant's overall percentage of time spent socially engaging with peers, including both social initiations and social responses, was calculated for each observation using 10-second intervals with a momentary time sampling procedure. An adapted version of the Bellini (2007) social observation system was employed.

Once a stable baseline trend was established (i.e., four data points for each participant), the social skills training commenced. The group was held twice per week for 11 weeks. Each session was approximately 30 minutes in duration. Eleven lessons from the Superheroes Social Skills program were used, in addition to the Introduction to the Group lesson. These lessons encompassed all beginning and intermediate skills. The group facilitators completed treatment integrity checklists at the end of each session to assess fidelity. During the intervention, analog free play and recess observations were

collected and later coded for all 4 of the participants with ASD. Analog free play sessions occurred directly following the second lesson of the skill being targeted each week. Recess observations were made, on average, every other week for each participant during the intervention phase.

Upon completion of the intervention, all of the participants in the Superheroes Social Skills group (i.e., both students with and without ASD) completed questionnaires (e.g., study-derived Child Consumer Satisfaction Surveys) to evaluate what they thought about the program. The teachers and parents again completed the SRS and ASSP, as well as the BIRS and an adapted Social Validity Scale to assess consumer satisfaction and the social validity of the program. After a 2-week follow-up period, the participants were again observed for 10 minutes during both the analog free play and recess periods.

Main Findings

The overall results of the current study demonstrate that Superheroes Social Skills is an effective program to teach social skills and promote the social interactions of elementary-aged students on the autism spectrum. It was found that the usage of several evidence-based practices, such as video modeling, inclusion of nondisabled peers, social narratives, and self-management strategies, could be combined into one comprehensive multimedia program.

Effect Sizes and PND

For the analog free play period, there were small effects for social initiations between baseline and treatment phases (*ES*=0.39), as well as between baseline and follow-up (*ES*=0.36). There were moderate effects for social responses between baseline

and treatment (*ES*=0.72) and baseline and follow-up (*ES*=0.73). For total social engagement during the free play period, there was a large effect between baseline and treatment (*ES*=0.85) and a moderate effect between baseline and follow-up (0.74). When gains were established, they were maintained during follow-up. The PND data were much more variable (i.e., ranged from 0% to 100% across participants) and did not match the results from the effect size calculations. Essentially, PND results showed that the intervention was not effective in increasing the participants' social initiations and responses, and only questionably effective in increasing overall engagement skills during the free play period.

Both the effect size and PND analyses showed substantial gains in participants' social engagement abilities over the course of the intervention, including follow-up, for the recess periods. All of the effect sizes for social initiations, social responses, and total social engagement were over 1.0, indicating large effects. With the exception of the social initiation results between baseline and treatment phases (i.e., questionable effects were found), PND data demonstrated that the social skills training program was an effective intervention in increasing participants social initiating, social responding, and overall social engagement skills during recess. Comparatively, the results indicated that the intervention had a much more significant effect during the generalization period (i.e., recess) than it did during a structured free play period.

Clearly, the social skills training program had a more significant impact on participants' social responding as opposed to social initiating skills in a structured free play setting, especially as found with the effect size calculations. Participants 1 and 3, who had negative effect sizes for social initiations in both baseline to treatment, and

baseline to follow-up phases, heavily influenced the lack of overall results for social initiations. And although the effect sizes for both social initiations and social responses were very large in the recess setting, social responses, on average, produced larger effects. Part of this finding could directly be explained by the coding system itself. If a participant appropriately continued a social interaction or conversation, they were given a social response code (e.g., RR). This definition was added to the coding system as reliability was being established with practice observations. Additionally, ASD participants may have found it easier to appropriately socially respond to the overtures made by their peers than to make their own social initiations.

Different Effects Based on Type of Analysis Used

The PND analyses, on average, resulted in less meaningful differences in social engagement in comparison to calculating effect sizes. PND was used in this study primarily in the attempt to be consistent with prior research evaluating the efficacy of social skills training programs with children with ASD, such as the Bellini, Peters et al. (2007) study. Although PND is easy to compute, often used in single-subject designs, and correlated with visual analysis, there are still inherent problems with using it (Riley-Tillman & Burns, 2009).

Parker, Hagan-Burk and Vannest (2007), as well as Riley-Tillman and Burns (2009) cite the following limitations with using PND:

1. There is no known sampling distribution
2. The reliability of the statistic is unspecified
3. It is not possible to compute confidence intervals
4. It requires its own interpretation guidelines because it is not a “true” effect size

5. The ceiling effects make it challenging to compare interventions
6. Results are based on only one baseline point (which could be an outlier and less reliable than a group of data)

The last of these criticisms (i.e., baseline outliers) was particularly evident in the baseline data for social initiations during analog free play for Participant 1. Thus, it seems that PND is really a measure of the consistency of change an intervention produces, rather than the magnitude of the change. Arguably, PND is a more conservative measure of treatment efficacy in comparison to using effect sizes. Parker et al. (2007) suggest the use of an alternative method to PND, called the percentage of all nonoverlapping data points (PAND), which uses all the data from baseline and intervention phases and can be interpreted with Pearson's Phi, which allows for *p* values and confidence intervals.

Pre- and Posttreatment Rating Scales

Results from the parent and teacher versions of both the SRS and ASSP checklists pre- and posttreatment showed that the social skills training intervention produced effective results in enhancing participants' social skills and competencies. There were positive changes found on both measures. Consistently, there were more dramatic changes in scores endorsed on the teacher reports. In fact, on the teacher SRS, the Total Score decreased, on average, from the clinical range (T=71) to a subclinical threshold (T=58.25). It could be that the teachers noted more significant changes in their students because many of the skills taught addressed compliance in the classroom (i.e., getting ready for instruction, following directions, and participating in discussions or activities), they were able to compare the participants with ASD to other students of the same age in

their classes, and they saw their students using the skills on a daily basis (e.g., using the steps for reducing anxiety or appropriately gaining teacher attention through use of a shoulder tap or by raising their hand in class).

On the SRS, both the teachers and the parents perceived the greatest change in scores to be for the Autism Mannerisms treatment subscale. These findings suggest that that the intervention was most successful in ameliorating some of the repetitive, odd, or rigid interests and behaviors children with ASD often possess. Parents rated the Social Cognition and Social Communication subscales to have the most stability (i.e., minor changes in scores pre- and posttreatment), while the teachers rated the Social Awareness and Social Motivation subscales as being the most difficult to change. These findings indicate that, for the parents, the intervention was less successful in impacting the participants' ability to interpret social cues and communicate socially during interactions. Conversely, the teachers perceived that participants had a more difficult time learning how to pick up on social cues (as opposed to interpreting them once they were acquired), as well as to motivate themselves to interact socially, which could be influenced by both social anxiety at school and not being able to empathize with peers.

There were also inconsistencies in parent and teacher reports regarding changes in the ASSP subscales pre- and posttreatment. Specifically, the parents saw more improvements on the Social Participation/Avoidance subscale (i.e., the participants were more likely to engage), while the teachers had higher ratings posttreatment on the Social Reciprocity subscale (i.e., the participants were better able to maintain social interactions and use perspective-taking skills). Both groups rated the Detrimental Social Behaviors subscale (i.e., socially inappropriate behaviors) as being the most difficult to change.

Behavioral Markers

There were no significant correlations between the number of Scooter or Black Hole cards distributed during the social skills training group with participants' total social engagement for the corresponding session (i.e., the number of cards accrued in a particular session was compared to the percentage of social engagement in the analog free play period directly following that session). Nor were there significant correlations found between the number of Power Charges obtained on a participant's Power Card and their total social engagement during the free play period. Although these were important elements of the Superheroes Social Skills group in establishing group compliance and reinforcing the acquisition and maintenance of new social skills, the distribution of these components was somewhat arbitrary. For example, before the intervention started, it was determined that each participant would be given at least three Scooter cards per session. However, the actual number of Scooter cards disseminated varied, depending on which facilitator was responsible for distributing the cards for that session. Some of the facilitators had higher distribution rates for both cards and Power Charges. Arguably, this subjectivity on the part of the facilitator impacted how many Scooter cards, Black Hole cards, and Power Charges each participant received, as opposed to actual rule-following behavior or the display of the targeted skill.

Consumer Satisfaction and Social Validity

The overall results of the BIRS, adapted Social Validity Scale, and the CCSS demonstrated that Superheroes Social Skills is a socially valid, acceptable, and effective program. These results were found for all of the consumers of the program, including the parents, teachers, children with ASD, and typically developing children. This finding is

imperative because if consumers do not like the intervention, even if it is proven to be effective, it is likely to not be used or implemented with fidelity.

Similar to the results found for the rating scales, the teachers had slightly higher scores in comparison to the parents. This result may be attributable to the fact that the teachers had more direct contact with the daily functioning of the group as well as with the facilitators, or that they saw more immediate and significant changes in the participants' behavior. Parents of the typically developing children had the highest of the parent ratings. The difference here could possibly be explained by the fact that the parents of the typically developing participants included their children to serve as helpers and thus rated the intervention slightly more positively.

When specific components of the program were evaluated, the parents and teachers reported that they liked the videos the most and the Power Cards the least, although both elements still received very high ratings. This could be because it was sometimes challenging to get the teachers to mark the Power Cards in the general education environment or have the students bring the Power Cards back from home because they would get lost. Again, although all of the components received very favorable reviews, the students with ASD remarked that they liked the videos and Comic Books the best, second to the Power Cards.

Treatment Integrity

The treatment integrity results (e.g., 100%) indicated an extremely high degree of fidelity. This could be attributable to a variety of factors. As part of each lesson, there was a posted schedule that was reviewed at the beginning of the group and then followed throughout the session. This schedule was created to provide needed structure for the

participants with ASD. Essentially, every aspect of the social skills lesson was included on this schedule and checked off when completed. Many of the participants with ASD would become visibly upset if a component was missed or not marked off. Additionally, due to the manualized structure of the program, specifically inclusion of the two-page reference sheets, it was extremely easy for the facilitator to follow and adhere to each part of the lesson. Finally, each lesson primarily consisted of video-based instruction through animated Superheroes characters that introduced the skills, provided a rationale, and outlined the basic steps to each skills, as well as stock videos of typical peers modeling the appropriate prosocial behaviors. Thus, for all of these reasons, it was not difficult to implement the intervention with integrity. Having a high degree of fidelity promotes practicality for the consumers who are using it.

How Results Fit with Prior Research

Overall

This study addressed all of the limitations or gaps identified in the social skills training literature for children with ASD, as put forth by Rao et al. (2008). Specifically, the Superheroes Social Skills program was designed and evaluated with children with ASD, in particular, those on the "higher functioning" end of the spectrum. Two of the participants in the current study had clinical diagnoses of Asperger's Disorder or PDD-NOS. All of the participants had verbal IQ scores over 69 and adequate language abilities. Thus, the intervention corresponded with diagnosis and ability level. The current study employed a single-subject design and included analysis of generalization and maintenance effects. Lastly, due to the manualization of the program, along with the

video-based instructional format, the intervention can be easily integrated and implemented in a variety of treatment settings.

Similarly, the Superheroes Social Skills program also abided by the principles endorsed by Krasny, Williams, Provencal and Ozonoff (2003) as being essential in the development of a social skills training group for children with ASD. In particular, they outlined the following factors as being key to an effective program: 1) make the abstract concrete; 2) provide structure and predictability; 3) provide scaffolded language support; 4) provide multiple and varied learning opportunities; 5) include "other" focused activities; 6) foster self-awareness and self-esteem; 7) select relevant goals; 8) program in a sequential and progressive manner; and 9) provide opportunities for programmed generalization and ongoing practice. In the Superheroes Social Skills program, each of the skills are broken down into distinct steps and both taught and reinforced in a variety of ways. Initially, foundational skills are introduced that later build into intermediate and advanced skills. Rationales are provided so that the students understand why the social skills are important. Most of the instruction is video-based, which appeals to the visual learning style of many individuals with ASD. The sessions follow the same format each time, and include both opening and closing routines. A schedule is followed to provide predictability. Visual supports are integrated when needed (e.g., picture icons corresponding to schedule items for the students that do not read). High interest materials, such as Superheroes, "Pokemon"-like Power Cards, and videos, are the basis of instruction. Lastly, generalization strategies, such as homework, are an integral part of the program.

The overall results of the current study were not congruent with some of the previous research on social skills training programs for children with ASD. For example, the Bellini, Peters, et al. (2007) meta-analysis found poor results for school-based interventions for children with ASD, especially when the students were taken out of their general education environment. Additionally, the students did not generalize the skills they learned to new settings. Even though the Superheroes Social Skills program employed a pull out service model for teaching social skills, substantial effects were still produced, with the largest effects found during the generalization setting (i.e., recess). It could be that, unlike many of the studies incorporated in the Bellini (2007) meta-analysis, Superheroes Social Skills was specifically designed to foster generalization (i.e., through usage of Comic Books, Power Cards, and videos that were used in their classroom and at home) and included many components that were already established as being effective with children with ASD.

Conversely, the overall results obtained in the current study do align well with other prior research. Superheroes Social Skills for Children with Autism is comprised of several different effective practices. This combined package was found to be efficacious in increasing the social engagement skills in children with ASD. Similarly, Odom, Boyd, Hall and Hume (2010) found that some comprehensive treatment models (CTMs) were effective, especially when they were behaviorally based. Specifically, these models had well defined procedures, were replicated, and had evidence of being effective. Additionally, a review of Early Intensive Behavioral Interventions (EIBI) (Eldevick, Hastings, Hughes, Jahr, Eikeseth & Cross, 2009) showed promising results, as did

another review (Reischow & Volkmar, 2010) asserting that social skills groups for children with ASD constitutes an established evidence-based practice.

Video-Modeling

Incorporating video-modeling strategies into social skills training programs for children with ASD has been extensively assessed through prior meta-analytic and single-subject study research (Bellini & Akullian, 2007; Bellini, Akullian & Hopf, 2007; Wang & Spillane, 2009). Out of three evidence-based interventions identified in the Wang and Spillane (2009) meta-analysis, only video-modeling was additionally described as "demonstrating high effectiveness as an intervention strategy." The National Autism Center (2009) classified video-modeling as an established treatment that specifically enhances communication, play, and interpersonal skills. Similarly, a recent review study (Reischow & Volkmar, 2010) categorized video-modeling as a promising evidence-based practice. Based on the research that substantiates the effectiveness of video-modeling interventions, it seems likely that the results obtained from the Superheroes Social Skills program were in part due to its inclusion of video-modeling practices.

Peer-Mediated Instruction

Meta-analytic research (Miller, 2006; Wang & Spillane, 2009; Zhang, 2008), as well as rigorous reviews of social skills interventions for children with ASD (Reichow & Volkmar, 2010) provides strong support for the integration of peers during social skills training programs as well as using peer-mediated intervention formats. Miller (2006) found that as children mature, peer-mediated interventions become more influential, in contrast to collateral skill interventions for younger students. This fits well with the age

group (i.e., 9 to 10-year-olds) being targeted in the current study. Additionally, the results of the current study match those found in the Zhang (2008) meta-analysis, in that peer-modeling interventions were the most effective. The highest increases seen were for social responses and involvement of school staff and family members was crucial. Inclusion of typically developing children in the Superheroes Social Skills program and use of peer-mediated instruction is consistent with prior research. The typically developing peers assisted the children with ASD during the role plays, in redirecting negative behavior, and during social games.

Social Stories

The usage of social stories is a common and socially valid intervention practice with children on the autism spectrum (Hanley-Hochdorfer, Bray, Kehle & Elinoff, 2010; Kokina & Kern, 2010). Although research results have been mixed (Delano & Snell, 2006; Hanley-Hochdorfer et al., 2010; Sansosti, Powell-Smith & Kincaid, 2004; Sansosti & Powell-Smith, 2006, 2008), a recent meta-analysis (Kokina & Kern, 2010) found that social stories can be effective in certain contexts, such as when they are used to decrease inappropriate behaviors, employed with elementary-aged children that have adequate social and communication abilities and low to moderate behavioral issues, driven by FuBA results, target one skill, and are brief in duration. Additionally, Wang and Spillane (2009) cite social stories as an evidence-based practice that yields large results.

The Superheroes Social Skills program used a version of social stories, termed social narratives. These social narratives occurred in the program in the format of Comic Books. Participants viewed the Comic Books digitally on the program DVDs, both during instruction in the group and then again as part of their homework. Additionally, a

printed copy of the Comic Book was sent home each week with the participants to be read with their family. Essentially, the Comic Books showed the superheroes practicing their newfound social skills in a variety of different social situations, providing a template of how the participants could use the skills. This study is consistent with prior research suggesting that using social narratives or social stories influences, in part, the social gains participants make.

Self-Management

Another component that has been shown to be effective in increasing appropriate social behaviors of children with ASD is the teaching of self-management strategies (Lee, Simpson, & Shogren, 2007). The authors defined self-management as including self-monitoring, self-evaluation, and self-reinforcement. All of these components were evident in the Superheroes Social Skills program. For example, at the beginning and end of each group, the participants counted how many Power Charges they had accrued for the skill they were working on, so that the total could be transferred to their corresponding Power Poster. There were several instances where the children asked to have a Power Charge when they displayed a specific skill, suggesting that they were monitoring and evaluating their own progress. Additionally, on the playground, there were numerous occasions where the participants were observed following the skills steps, sometimes even referring to their Power Card. For example, one participant looked at another peer who cut in line to go down the slide, briefly examined his Power Card, and stated, “She’s not following the steps.” The results found in the current study align with the meta-analytic research supporting the adoption of self-management strategies in social skills training programs with children with ASD.

Generalization and Maintenance Factors

Two of the major problems cited in social skills training research, which also appears in studies that specifically target children with ASD, are the lack of generalization and maintenance effects (Bellini, Peters, et al., 2007; Du Paul & Eckert, 1994; Ozonoff & Miller, 1995). However, the results obtained in the current study demonstrated that the Superheroes Social Skills intervention enhanced these components (i.e., there were larger effects during the generalization period and good preliminary maintenance effects after a 2-week follow-up period).

There could be several explanations as to why there were greater effects during recess than the analog free play period. For one, there were more natural opportunities to respond in the recess environment as opposed to the contrived analog free play setting. There were more possible play scenarios, as well as a wider variety of play materials (e.g., tag and chase games, Red Rover, basketball, tetherball, wall ball, four square, and pretend games like "Star Wars"). Additionally, instead of a limited number of the same peers in the analog free play setting, ASD participants had the opportunity to respond to numerous social overtures made by peers on the playground. Secondly, it may be that the playground atmosphere encourages cooperative, as opposed to solitary play. Lastly, the ASD participants were observed using their new skills gained from the social skills training program to interact with new peers. Social interactions on the playground occurred with both "peer buddies" as well as new friends (e.g., Participant 4).

Most of the components for increasing generalization as listed by Morgan and Jenson (1988) and Stokes and Baer (1977) were addressed in some manner in the Superheroes Social Skills program. For example, the program included the following

elements: 1) natural and varied reinforcement contingencies; 2) the teaching of multiple examples of the targeted skills through the role plays, peer video-models, and social games; 3) including typical peers in the SST to reinforce prosocial behaviors; 4) involving students in the intervention through the use of self-monitoring; 5) integrating components of the intervention into all settings (e.g., Power Cards, Comic Books, and videos).

Additionally, the concept that ideas can be "sticky" (Gladwell, 2000; Heath & Heath, 2007) may also help explain why the generalization effects were so robust in the current study. The six principles that make an idea "sticky" (Heath & Heath, 2007) were integrated into Superheroes Social Skills for Children with Autism program: simplicity, unexpectedness, concreteness, credibility, emotions, and stories. The video-based instructional format of the SST was unexpected in comparison to traditional didactic models. The animated superheroes characters created credibility and had emotional appeal (i.e., the participants with ASD related to Scooter the Robot with social difficulties). The social narratives in the form of Comic Books provided a context where participants were given examples of the superheroes using their skills in varied settings. The steps to each social skill were simple and concrete.

Similar to the Muppet characters in Sesame Street that helped produce lasting literacy effects (Gladwell, 2000), the animated superheroes and peer video-models in the social skills training program may have been "sticky" enough to grab the participants' attention and help them retain the information they were being taught, namely the critical social skills. Arguably, the Incredible Year's Dinosaur Social Skills and Problem Solving curriculum (Juvenile Justice Bulletin, 2000), which was developed to increase

social interaction skills in young children with conduct problems and also integrates many of the same components as Superheroes Social Skills (e.g., video modeling, reward contingencies, role playing, social activities and games, and homework to foster generalization) also has integral features that make it "sticky." Specifically, the Dina Dinosaur program utilizes a captivating dinosaur theme and uses puppets to instruct the preschoolers on various skills, such as making and keeping friends, learning school rules, understanding and detecting feelings, and problem solving. The curriculum produced significant increases in children's prosocial behaviors, effects that were maintained at a 1-year follow-up (Webster-Stratton & Hammond, 1997). Indeed, much like the Muppets and Dina Dinosaur program's puppets, superheroes and videos appear to be "sticky" to children on the autism spectrum.

Lastly, the concept of "behavioral trapping" may have contributed to the positive results demonstrated in the generalization setting. McConnell, Sisson, Cort and Strain (1991) describe behavioral trapping as "the process by which newly acquired behaviors come under the control of naturally occurring communities of reinforcement" (p. 474). Thus, the newly learned skills gained from the Superheroes Social Skills program, such as asking a peer to play, are naturally reinforced and maintained by typical peers on the playground.

Limitations and Future Research

There were several limitations in the current study. Because the study was a single-subject AB design and not a multiple baseline design, there may have been both external and internal validity threats. The intervention was developed to be group based, meaning all children began the group at the same time. Thus, it was not possible to

structure the design of the study differently. However, because the study abided by the criteria suggested by Kazdin (1981) (e.g., objective data, repeated assessments, targeting chronic or longstanding behavior, heterogeneous groupings, and immediate and substantial effects) and Kratochwill (1992) (e.g., planned study, high treatment integrity, and standardized treatment), it is much more likely that these threats did not come into play.

Secondly, other than the initial parent training and occasional newsletters and/or phone calls to remind parents of the targeted skill being addressed, there was no systematic process for tracking how well each family adhered to the home components (i.e., watching videos, reading comic books, baiting the skills, etc.). These variables could feasibly have impacted the effectiveness of the program but there was no way to check for them. It was possible to track how many Power Charges the student brought back on their Power Card, although more difficult sometimes to differentiate which were obtained at home or at school. It was also possible to monitor which students returned their Comic Books, but not know with certainty if the parents had read it with their child. Also with some participants, returning the Power Card and Comic Book waned over time. Future research should address the utility and feasibility of having students bring their Power Card and Comic Book to and from group.

Thirdly, there was no measure of actual opportunities to respond in the observational system used to record improvements in social engagement skills, rather just a record of the actual responses of participants. If a participant had more opportunities to respond, this may have altered their actual response rates. Thus, the current study may be

an underestimate of participants' social engagement skills. Future research should be aimed at evaluating how opportunities to respond impacts social responding.

The fourth limitation of the current study is that the intervention was researched by one of the authors who initially developed the program. Even though there was high interrater reliability, neither of the coders was blind to the purpose of the study. This study was a pilot study and one of the first to evaluate the effectiveness of the Superheroes Social Skills intervention. However, it will be important to have independent researchers and/or independent research sites assess the efficacy of the program in different contexts, as well as to determine if the results found are replicable. Making steps toward independent replication will aid in the intervention being considered a well-established practice (Chambless, 1998).

A final limitation is that the social skills training was conducted solely in a pull out service format (i.e., the intervention occurred in the facilitator's office as opposed to a general education classroom). Although there were still large overall effects, it will be important for future research to address the effectiveness of the program as implemented in other settings such as the child's natural environment (e.g., general education classroom, resource room, or school-wide), with other facilitators (e.g., parents), with other populations of students (e.g., children with behavioral disorders or developmental delays), and with children of various ages (i.e., secondary students). Investigating these other variables will also enhance the generalization of the program.

The current study found excellent generalization and preliminary maintenance effects results in the recess setting. Future research could investigate the generalizability of results to other settings such as at home or in the general education classroom.

Additionally, future research could examine whether follow-up effects are maintained for longer periods of time beyond 2 weeks.

Lastly, future research could focus on developing interventions that specifically target and enhance social initiating skills in children with ASD. Participants in the current study, on average, made more improvements in social responding than they did in initiating social interactions.

Implications for Practice

The results of the current study support the usage of the Superheroes Social Skills for Children with Autism in increasing social engagement skills for children with ASD. Findings included high levels of treatment fidelity (i.e., the intervention was easily implemented as intended). Additionally, all of the consumers, including parents, teachers, and the children who directly participated in the social skills training, indicated that they were satisfied with the intervention, perceiving it to be socially valid, effective, and acceptable.

Bowen, Jenson and Clark (2004) distinguished several factors that increase the likelihood that teachers will use an intervention: time, complexity, cost, whether it is positive, student interest, inherent risks and hassles, social validity, and efficacy. The basic tenets of Superheroes Social Skills meet most of these requirements based on the aforementioned results.

As the number of individuals diagnosed with an ASD continues to rise, it becomes more critical to identify treatments that have been proven to be effective and to intervene early. Especially important is finding interventions that target the core deficit of ASDs, namely significant impairments in social interaction skills. The Superheroes

Social Skills program appears to be a promising evidence-based intervention that addresses these objectives.

APPENDIX A

AUTISM SOCIAL SKILLS PLACEMENT CHECKLIST

Autism Social Skills Placement Checklist

Purpose: Have caregivers and educators complete to assist in making group constellation and inclusion decisions

Directions: Please answer the following questions as best as you can. Pick only one answer and try to complete all items. If you are unsure about how to answer a question, use your best judgment and answer based on the child's behavior over the past two weeks.

Background Questions

Respondents's Name: _____ Relationship to child: _____
Child's Name: _____ Child's Date of Birth: _____
At what developmental age does the child function? _____
What grade is the child in at school? _____

Language Abilities

How would you describe the child's language abilities? (Circle one)
Nonverbal (or Echolalic) Use of 1-2 words Phrase speech Verbally fluent

Cognitive/Problem Solving Abilities

How would you describe the child's cognitive abilities? (Circle one)
Superior Above average Average Below Average Impaired
If the child has been given an IQ test, please provide the information below:
Name of test: _____ Who administered the test? _____
When was the test given? _____ Where was the test given? _____
What were the scores? _____

Diagnosis of Autism Spectrum Disorder

Does the child carry a diagnosis of an ASD? (Circle one) Yes No Not Sure
If so, what is it? (Circle one) Autistic Disorder/Autism Asperger's Disorder PDD-NOS
Is this an educational classification or a clinical diagnosis? _____

Behaviors and Interests

Does the child have any particularly intense or unusual interests/behaviors that interfere with his/her social interactions with others? Yes/No If so, please describe below:

_____

_____

Motivation and Learning Style

What is the child's typical motivational level? (Circle one)
Very motivated Somewhat motivated Not motivated
What are the child's favorite things or activities? _____
Is the child more of a visual or auditory learner? _____

Attention Span and Persistence

Describe the child's activity level (Circle one)

Extremely active Somewhat active Average Below average Lethargic

Memory Abilities

Describe the child's memory abilities (Circle one)

Excellent Good Average Fair Poor

Anxiety and other Psychological Factors

What causes the child to become upset? (Circle all that apply)

New situations New people Change in routine Frustrating activities

Can the child calm himself when upset or does s/he need help in doing so?

_____

What strategies have assisted the child in managing negative feeling states? _____

Other relevant factors

Are there any other important factors or considerations we should know about your child?

_____

_____

Thanks for your help in completing this. The information is very useful!

APPENDIX B

EDUCATIONAL AND DIAGNOSTIC CRITERIA

FOR AUTISM SPECTRUM DISORDERS

DSM-IV-TR (2000) Criteria for Autistic Disorder

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3)

(1) qualitative impairment in social interaction, as manifested by at least two of the following:
- (a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
- (b) failure to develop peer relationships appropriate to developmental level
- (c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
- (d) lack of social or emotional reciprocity

(2) qualitative impairments in communication as manifested by at least one of the following:
- (a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
- (b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
- (c) stereotyped and repetitive use of language or idiosyncratic language
- (d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(3) restricted repetitive and stereotyped patterns of behavior, interests and activities, as manifested by at least two of the following:
- (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
- (b) apparently inflexible adherence to specific, nonfunctional routines or rituals
- (c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
- (d) persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years:

- (1) social interaction,
- (2) language as used in social communication, or
- (3) symbolic or imaginative play

C. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

DSM-IV-TR (2000) Criteria for Asperger Syndrome

A. Qualitative impairment in social interaction, as manifested by at least two of the following:

1. marked impairments in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
2. failure to develop peer relationships appropriate to developmental level
3. a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by a lack of showing, bringing, or pointing out objects of interest to other people)
4. lack of social or emotional reciprocity

B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

1. encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
2. apparently inflexible adherence to specific, nonfunctional routines or rituals
3. stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
4. persistent preoccupation with parts of objects

C. The disturbance causes clinically significant impairments in social, occupational, or other important areas of functioning

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years)

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than social interaction), and curiosity about the environment in childhood

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia

DSM-IV-TR Criteria for Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS)

A diagnosis of pervasive developmental disorder, not otherwise specified (PDD-NOS) is made when there is a severe and pervasive impairment in the development of reciprocal social interaction or verbal and nonverbal communication skills, or when stereotyped behavior, interests, and activities are present, but the criteria are not met for a specific pervasive developmental disorder, schizophrenia, schizotypal personality disorder, or avoidant personality disorder. For example, this category includes "atypical autism" – presentations that do not meet the criteria for autistic disorder because of late age at onset, atypical symptomatology, or subthreshold symptomatology, or all of these.

Educational Criteria

AUTISM

Evaluation and Eligibility Determination for Autism

Definition from Utah State Board of Education Rules for Special Education

Autism is a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, which adversely affects a student's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environment change or change in daily routines, and unusual responses to sensory experiences.

1. Autism does not apply if a student's educational performance is adversely affected primarily because the student has an emotional disturbance or an intellectual disability, as defined in these Rules.

2. A student who manifests the characteristics of autism after age 3 could be identified as having autism if the team determines that the student meets the definition of autism under these Rules.

APPENDIX C

IRB PARENTAL PERMISSION AND ASSENT FORMS

Parental Permission Document

BACKGROUND

Your child_____ is being asked to take part in a research study to be completed at Jennie P. Stewart Elementary School. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Ask if there is anything that is not clear or if you would like more information. The Principal Investigator, Ms. Block, is available to answer any questions or concerns you may have prior to you giving your permission for your child to participate. Take time to decide whether you will allow your child to take part in the study.

The purpose of this research study is to evaluate the effectiveness of a school-based social skills training program designed for elementary-aged children with autism spectrum disorders (ASD). Peers that do not have an ASD will also participate in this program. Additionally, this study will assess how well students, parents, and teachers like the program. Research has shown that the majority of social skills interventions currently used in schools with students with ASD are marginally effective. Because many children with an ASD experience difficulty relating to others socially, it is essential to find interventions that work to increase and develop children's social abilities and competencies. This social skills program is unique in that it combines a variety of interventions known to be effective with children with ASD, such as video-modeling, inclusion of same-aged peers without disabilities, and self-management techniques. There are also generalization strategies such as a social story homework component in the format of a comic book and a "Power Card" that is marked by teachers and parents when the child displays the targeted social skill outside of the group context. The presentation style of the program is hopefully enticing and motivating to the students. Essentially, animated "Superheroes" characters introduce, teach the steps to, demonstrate, and provide a rationale for why each social skill is important via video instruction. It is crucial to investigate whether or not this program works, as the results could lead to important practical implications of social skills training for students with ASD in our schools.

The research will be conducted by Ms. Heidi Block, who is the school psychologist intern at Jennie P. Stewart Elementary School within the Davis School District, and who is also a Ph.D. candidate at the University of Utah in the Educational Psychology Department.

STUDY PROCEDURE

This study involves several different parts. Initially, your child will be selected to participate in the social skills training group because either he or she was identified as a

student with an ASD or was nominated by his or her teacher as a student without a disability that could benefit from participation in this group and act as a “peer buddy” or helper to the other students. Prior to the onset of the study, Ms. Block will have the parents and teachers of the students with an ASD complete rating scales or questionnaires to ensure the child meets criteria for having an ASD, as well as to gather initial information regarding their social skills and competencies. It will take between 35-50 minutes to complete these scales. The parents and teachers of the other students will not be required to complete any of the questionnaires.

If you and your child consent to be in the study, your child will participate in the social skills group twice a week for 18 weeks or 36 sessions. Each session will last approximately 30 minutes and follow a similar format. During each session, your child will be taught various social skills through the instruction of animated Superheroeses via a DVD video. Some examples of the skills taught include following directions, anxiety reduction, initiating and maintaining a conversation, joining in, and responding to teasing and bullying. The characters “The Initiator,” “Interactor Girl,” and their sidekick robot, “Scooter,” will define, provide a rationale, give the discrete steps to, and demonstrate the social skills. Additionally, peer models will also demonstrate the social skills on the video. Children in the group will have the chance to practice newly acquired skills during role-plays, social games, and in free-time. For example, the social game in the following directions lesson is called “Scooter Says,” a variation on “Simon Says.” Children will also watch a digital comic book, which is a social story where the animated characters further show how to use the targeted social skills.

During instructional time, your child will have the opportunity to earn small rewards for following group rules. Additionally, Ms. Block will monitor when your child displays the steps and demonstrates the skills he or she is learning by marking the occurrences on a special card called a “Power Card.” This card will go home with your child so that you and his or her teachers can also mark the card outside of the group. Your child will be provided with a homework assignment at the end of each lesson. Homework assignments typically consist of viewing a video and reading a social skills comic book. You will be asked to do these activities with your child three times a week. The DVD and cards will be provided to you. You are not required to do the homework and there will be no consequence to you or your child for not completing the homework. These procedures will be explained again during a parent training session prior to the start of the study and any questions or concerns you may have can be addressed then or you may also contact Ms. Block at any time. The social skills program is experimental, meaning that it has not been previously tested.

At the end of the study, Ms. Block will again have the parents and teachers of the students with an ASD complete rating scales and questionnaires. Again, it will take between 35-50 minutes to complete these scales. Periodically throughout the study, your child's social initiations and responses will be observed and coded through use of an observational system. This will occur during the social skills group free play time as well as during your child's recess. The purpose of this system is to assess the impact of the social skills training on your child's social skills, specifically your child's social engagement with others. The parents and teachers of the other students will not be required to complete any of the questionnaires and the children will not be observed with the observational system.

RISKS

The risks of this study are minimal. There is a risk that your child may not enjoy participating in the social skills lessons and may become uncomfortable while practicing the skills being learned. If your child feels upset in any way as a result of their participation, you or your child may tell Ms. Block, who can help to alleviate any distress. There is a risk that your child may become embarrassed when leaving the classroom to attend the social skills group and may feel afraid that other children may tease him or her. Efforts will be made to keep other students from knowing your child is participating in the intervention and to also schedule the social skills group at a time where your child is least likely to miss valuable academic instruction. These risks are similar to those that your child might experience in his or her every day school experience in a typical educational setting.

In addition to the risks listed above, your child may experience previously unknown or unforeseen risk.

BENEFITS

We cannot promise any direct benefit to your child for taking part in this study. However, possible benefits from participation in the social skills training program include acquisition and mastery of new social skills, increased demonstration of socially appropriate behaviors, as well as the development of new friendships and maintenance of prior social relationships. The results of the questionnaires may also provide useful information to you and your child's teacher. We also hope the information we get from this study may help develop a greater understanding of what school-based social skills treatments are most effective for children with ASD.

ALTERNATIVE PROCEDURES

If you do not want your child to participate in this study, your child will continue with his or her regularly scheduled school activities. There are alternative social skills programs

and interventions for children with ASD that can be provided to you and your child's teacher. You may talk with Ms. Block in her role as the school psychologist intern at Jennie P. Stewart Elementary to discuss alternative school-based interventions and/or referrals to mental health specialists and resources found within the community. Your child's participation will not prevent you from receiving additional help and/or treatments.

CONFIDENTIALITY

Personal information obtained about your child will be kept strictly confidential. Each child with ASD that participates will be assigned a number which will be used on study materials instead of their name. The hard copies of the study materials will be stored in a locked filing cabinet located in Ms. Block's private office within the school. Ms. Block is the only person that has the key and access to the filing cabinet. Electronic data will be stored on Ms. Block's personal computer, which is password protected. Only Ms. Block and the members of the research team will have access to this information. The results of this study may be presented at professional conferences and/or published in a professional journal. If this occurs, your child's personal information will be protected.

As mandated by reporting laws, should your child disclose actual or suspected abuse, neglect, or exploitation of a child, or disabled or elderly adult, the researcher or any member of the study staff must, and will, report this to Child Protective Services (CPS), Adult Protective Services (APS) or the nearest law enforcement agency.

PERSON TO CONTACT

If you have questions, complaints, or concerns about the research or related matters, or if you feel your child has been harmed as a result of participation in the study, please contact Ms. Block at Jennie P. Stewart Elementary, either by phone or by e-mail. You may also leave a message on a confidential voicemail if you do not reach Ms. Block in person. Contact information is listed below:

Heidi Block (Principal Investigator)
1155 North Main Street
Centerville, UT 84014
(801) 402-1877 (M-F 8:30-4:30)
hblock@dsdmail.net

INSTITUTIONAL REVIEW BOARD

Contact the Institutional Review Board (IRB) if you have questions regarding your child's rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The

University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

VOLUNTARY PARTICIPATION

It is up to you to decide whether to allow your child to take part in this study. Participation is strictly voluntary. Refusal to allow your child to participate or the decision to withdraw your child from this research will involve no penalty or loss of benefits to which your child is otherwise entitled. This will not affect your or your child's relationship with Ms. Block or the services she provides to children at Jennie P. Stewart Elementary School. You may choose to withdraw your child at any time without providing a reason.

COSTS AND COMPENSATION TO PARTICIPANTS

There are no costs to participate in this study. The materials used in the program, such as the comic book social stories and DVD lessons to review at home will be given to you at no charge.

As noted previously in the sections above, your child may be given small rewards for following the group rules and for his or her participation during group time. The rewards will be different and may vary in cost. Your child will not know what the reward is beforehand. Examples may include free game time, popcorn party, various food treats, a juice box, or a small toy. Any reward that you or your child is not comfortable with will not be used.

CONSENT

By signing this consent form, I confirm I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

_____

Child's Name

_____

Parent/Guardian's Name

_____ _____

Parent/Guardian's Signature Date

_____
Relationship to Child

_____
Name of Researcher or Staff

_____ _____
Signature of Researcher or Staff Date

Assent Document

Purpose of the Research

We are asking you to take part in a research study because we are trying to learn more about helping children learn how to make new friends and be a good friend to others.

Procedure/Intervention/Method

If you agree to be in this study, you will participate in a social skills group outside of your classroom two times a week for approximately thirty minutes. The group will be held in Ms. Block's office in the school for about eighteen weeks. There will be several other students close to your same age that will also participate in the group. You will learn and practice what you can do to make new friends and be a good friend to others. Some examples of the things you may learn are how to follow directions, feel calm when you are worried or nervous, talk to other children and join in, and how to respond when another child is teasing and/or bullying you.

During each group, you will watch movies, act out some of the things you learn, play games, and read comic books about Superheroes. You may earn small rewards for following the group rules and showing or acting out what you have learned. You will be asked to practice some of the things we learn in group at home, such as reading a comic book with your parents and watching a movie. After the group ends, you will be asked to complete some questionnaire about yourself and what you thought about being in the group. It will take you less than ten minutes to do this.

Risks

By participating in this group, there may be several risks. You may not like leaving class to attend group. Your teachers will try to make sure that you leave class at a time where you will miss the least amount of work and they will help you make up any work you may miss. They will also try to make sure that other children don't know that you are in the study if you don't want them to know. You may feel nervous when you are asked to practice some of the things you learn in group. If this happens, your teachers will try to help you feel better and find ways to make it easier for you. You may also not like completing the questionnaires. If you have any questions, you can ask for help at any time. You also can choose not to participate at any time.

Benefits

Being in this study will help us to understand the best way to help kids learn how to make friends and be a good friend to others. Your participation in this group may help you make friends and learn how to be a better friend.

Alternative Procedures and Voluntary Participation

If you don't want to be in this study, you don't have to be in it. Remember, being in this study is up to you and no one will be upset if you don't want to participate. You can change your mind later if you want to stop. Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes" you can still decide not to do this.

Confidentiality

All of your records about this research study will be kept locked up so no one else can see them. We will not use your name when we talk about this study and only your teachers and the other students participating with you will know that you came to group.

Person to Contact

You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me, Ms. Block, at school at (801) 402-1877, or ask me next time you see me, or ask your teacher if you can come by my office.

Consent

Signing my name at the bottom means that I agree to be in this study. My parents and I will be given a copy of this form after I have signed it.

_____

Printed Name of Child

_____ _____

Signature of Child Date

_____

Printed Name of Witness

_____ _____

Signature of Witness Date

APPENDIX D

AUTISM SOCIAL SKILLS PROFILE

Autism Social Skills Profile

Scott Bellini

Child's Name: _____
FIRST MIDDLE LAST

Birthdate: _____ Age: _____ Sex: ☐Female ☐Male Today's Date: _____
MO. DAY YEAR MO. DAY YEAR

School: _____ Grade: _____

Your Name: _____
FIRST MIDDLE LAST

Relationship to Child: ☐Mother ☐Father ☐Guardian ☐Other _____

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: (_____) _____

The following phrases describe skills or behaviors that your child might exhibit during social interactions or in social situations. Please rate **HOW OFTEN** your child exhibits each skill or behavior independently, **without assistance from others** (i.e., without reminders, cueing and/or prompting). You should base your judgment on your child's behavior over the last **3 months**.

Please use the following guidelines to rate your child's behavior:

Circle **N** if your child **never** or **almost never** exhibits the skill or behavior.

Circle **S** if your child **sometimes** or **occasionally** exhibits the skill or behavior.

Circle **O** if your child **often** or **typically** exhibits the skill or behavior.

Circle **V** if your child **very often** or **always** exhibits the skill or behavior.

Please do not skip any items. If you are unsure of an item, please provide your best estimate. You may use the "Brief Description" section to provide additional information on the particular skill or behavior. For instance, if your child will exhibit a particular skill or behavior more frequently when cueing or prompting is provided, or when interacting with adults rather than peers, please make note of this in the "Brief Description" section.

Autism Social Skills Profile

Never	Sometimes	Often	Very often
N	S	O	V

Skill Area	How Often	Brief Description
Invites Peers to Join Him/Her in Activities	N S O V 1 2 3 4	
Joins in Activities With Peers	N S O V 1 2 3 4	
Takes Turns During Games and Activities	N S O V 1 2 3 4	
Maintains Personal Hygiene	N S O V 1 2 3 4	
Interacts With Peers During Unstructured Activities	N S O V 1 2 3 4	
Interacts With Peers During Structured Activities	N S O V 1 2 3 4	
Asks Questions to Request Information About a Person	N S O V 1 2 3 4	
Asks Questions to Request Information About a Topic	N S O V 1 2 3 4	
Engages in One-On-One Social Interactions With Peers	N S O V 1 2 3 4	
Interacts With Groups of Peers	N S O V 1 2 3 4	
Maintains the "Give-and-Take" of Conversations	N S O V 1 2 3 4	
Expresses Sympathy for Others	N S O V 1 2 3 4	
Talks About or Acknowledges the Interests of Others	N S O V 1 2 3 4	

Autism Social Skills Profile

Never	Sometimes	Often	Very often
N	S	O	V

Skill Area	How Often	Brief Description
Recognizes the Facial Expressions of Others	N 1 S 2 O 3 V 4	
Recognizes the Nonverbal Cues, or "Body Language" of Others	N 1 S 2 O 3 V 4	
Requests Assistance From Others	N 1 S 2 O 3 V 4	
Understands the Jokes or Humor of Others	N 1 S 2 O 3 V 4	
Maintains Eye Contact During Conversations	N 1 S 2 O 3 V 4	
Maintains an Appropriate Distance When Interacting With Peers	N 1 S 2 O 3 V 4	
Speaks With an Appropriate Volume in Conversations	N 1 S 2 O 3 V 4	
Considers Multiple Viewpoints	N 1 S 2 O 3 V 4	
Offers Assistance to Others	N 1 S 2 O 3 V 4	
Verbally Expresses How He/She Is Feeling	N 1 S 2 O 3 V 4	
Responds to the Greetings of Others	N 1 S 2 O 3 V 4	
Joins a Conversation With Two or More People Without Interrupting	N 1 S 2 O 3 V 4	
Initiates Greetings With Others	N 1 S 2 O 3 V 4	

Autism Social Skills Profile

Never	Sometimes	Often	Very often
N	S	O	V

Skill Area	How Often				Brief Description
Provides Compliments to Others	N 1	S 2	O 3	V 4	
Introduces Self to Others	N 1	S 2	O 3	V 4	
Politely Asks Others to Move out of His/Her Way	N 1	S 2	O 3	V 4	
Acknowledges the Compliments Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Allows Peers to Join Him/Her in Activities	N 1	S 2	O 3	V 4	
Responds to the Invitations of Peers to Join Them in Activities	N 1	S 2	O 3	V 4	
Allows Others to Assist Him/Her With Tasks	N 1	S 2	O 3	V 4	
Responds to Questions Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Experiences Positive Peer Interactions	N 1	S 2	O 3	V 4	
Compromises During Disagreements With Others	N 1	S 2	O 3	V 4	
Responds Slowly in Conversations	N 1	S 2	O 3	V 4	
Changes the Topic of Conversation to Fit Self-Interests	N 1	S 2	O 3	V 4	
Misinterprets the Intentions of Others	N 1	S 2	O 3	V 4	

Autism Social Skills Profile

Never	Sometimes	Often	Very often
N	S	O	V

Skill Area	How Often	Brief Description
Makes Inappropriate Comments	N 1 S 2 O 3 V 4	
Engages in Solitary Interests and Hobbies	N 1 S 2 O 3 V 4	
Ends Conversations Abruptly	N 1 S 2 O 3 V 4	
Fails to Read Cues to Terminate Conversations	N 1 S 2 O 3 V 4	
Exhibits Fear or Anxiety Regarding Social Interactions	N 1 S 2 O 3 V 4	
Experiences Negative Peer Interactions	N 1 S 2 O 3 V 4	
Engages in Socially Inappropriate Behaviors	N 1 S 2 O 3 V 4	
Exhibits Poor Timing With His/Her Social Initiations	N 1 S 2 O 3 V 4	
Is Manipulated by Peers	N 1 S 2 O 3 V 4	
Engages in Solitary Activities in the Presence of Peers	N 1 S 2 O 3 V 4	

APPENDIX E

BEHAVIORAL CODES FOR SOCIAL INITIATIONS AND RESPONSES AND OBSERVATION RECORDING SYSTEM FORM

Social Engagement:
Participation in activity or play sequence with peer involving shared toys, objects, and play items. Parallel play with separate play items is excluded from this code; however, an exchange of play items during the interval should be coded as social participation. Examples include being pushed in a wagon, taking turns during a board game, playing jointly with paint, play dough, building blocks, brushes, cars, dolls, etc. Also, asking questions, or responding to questions, and engaging in conversations should be coded as participation. Any unprompted social response or initiation during an observation interval should be recorded as social engagement for that interval (see codes below).

Social Initiation

a. Request Assistance
b. Request Information
c. Request Interaction/Participation
d. Joining-in Play Activity or Interaction
e. Greeting/Compliment
f. Giving/Sharing/Showing
g. Offer Comfort/Physical Affection

Initiation: defined as the child beginning a new social sequence, distinguished from a continuation of a previous sequence by a change in partner, change in activity, or a discontinuation of the previous play sequence for at least 5 seconds.

- Requesting (non-verbal) using a sign or other nonverbal behavior (e.g., handing or bringing an object to other person to request an activity, interaction, or assistance (e.g., raise hand) with others

- Requesting (verbal) using questions or directives to obtain items or to get others to engage in actions or interactions, or to request assistance

- Play initiation--gets other person's attention by gesturing, holding up an object, tapping a child on the shoulder, asking other person to play, or calling his or her name, joining-in a play activity or interaction with other children (w/o being requested to do so)

- Asking social questions and requesting information. Questions that are not for the purpose of requesting objects or interactions. Asking questions about what is happening; what will happen next; how people feel; or who is doing what

- Comments. Talking about feelings or what is happening during the social situation.

- Giving/ sharing. Giving an object to other person or sharing an object with which the child is already playing.

- Praise/Compliment/Greeting. Statements of approval, affection, greeting, or admiration of other. Also include non-verbal gestures of greeting, such as waving “hello” or “goodbye.”

- Physical affection—Positive physical contact such as hugging, kissing, holding hands.

- Play organizer-- Verbally specifies an activity, suggests a play area, or directs other person to engage in any activity related play behavior; verbally or nonverbally offers or requests an object from the other person

- Comfort/Reassurance—Verbal or physical consolation when another person is in some way distressed

Social Responses

a. Request for Assistance
b. Request for Information
c. Request for Interaction/Participation
d. Greeting/Compliment
e. Offer to Share to Object
f. Physical Affection
    - Provides assistance to other person following a request

    - Verbally responds or responds non-verbally (e.g., nods head) to questions directed at him by others

    - Joins in activity following request or invitation

    - Verbally or non-verbally (gesture, such as a wave, or facial expression, such as a smile) responds to greeting or compliment from others

    - Accepts toy or object from other person when offered, by grabbing, looking, or holding object. Looks in the direction of an object when directed by other person to do so

    - Accepts physical affection (i.e., touch or hug) from other person without moving away from, or physically rebuking other person’s attempt at physical affection (e.g., pushing other person away, running away, etc.

Observation Recording System for Social Engagement

Target Student_____ M/F_____
Grade_____
School_____ Teacher_____
Date_____
Observer_____
Position_____
Social Activity_____ Structured/Unstructured Setting_____

Directions: Each box represents a 10 second interval. Observe the student and record the code after 5 seconds have elapsed, with 5 seconds to write in your response. If you see more than one behavior, code the initial behavior observed. If possible, collect data for the full observation period. Codes are as follows:

Social Initiations: **RA**=Request Assistance, **RI**=Request Information, **RIP**=Request Interaction/Participation, **JI**=Independently Joins Play Activity or Interaction, **GC**=Provide a Greeting/Compliment, **GSS**=Giving, Sharing, Showing, **OCA**=Offer Comfort/Physical Affection

Social Responses: **PA**=Provides Assistance, **RR**=Responds to Request/Provides Information, **JA**=Joins Activity when Asked, **RGC**=Responds to Greeting/Compliment, **SO**=Offers to Share/ to Object, **RPA**=Responds to Physical Affection

Play/Other Codes:
DR=Disruptive Behavior, **CP**=Continues to Play Appropriately, **SB**=Self-Stimulatory Behavior, **PP**=Parallel Play, **COP**=Cooperative/Interactive Play, **SP**=Solitary Play

Social Initiations															
Social Responses															
Play/ Other															

Notes:

Social Initiations															
Social Responses															
Play/ Other															

Notes:

Social Initiations															
Social Responses															
Play/ Other															

Notes:

Social Initiations															
Social Responses															
Play/ Other															

Notes:

(Adapted from Bellini, 2007 and used with permission.)

APPENDIX F

SOCIAL VALIDITY SCALE

Sample Social Validity for Teachers and Parents

Note: This sample form was designed specifically for a video-self modeling intervention, but can be used with other interventions by making just a few modifications.

Teacher Name:
Student's Name:
Date:

Please check the box below to indicate whether the student viewed the video on that day. If the child was absent, write "absent" in the box. If school was not in session that day, write "no school." If only a portion of the video was shown that day, write "PS" for partial showing. Finally, if you were not able to show the student the video because of equipment failure, please write "EF" in the box for that day.

Monday	Tuesday	Wednesday	Thursday	Friday

Please indicate how you think the intervention is going this week. Please circle the response that best describes this week of the intervention.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

The intervention has interfered with normal classroom activity

SD D A SA

The intervention is distracting to the other students

SD D A SA

The student enjoys watching the video

SD D A SA

The intervention is easy to implement

SD D A SA

I believe the intervention is beneficial to the student

SD D A SA

I enjoy being part of this intervention

SD D A SA

Additional Comments:

APPENDIX G

CHILD CONSUMER SATISFACTION SURVEY

Child Consumer Satisfaction Survey

(Study Derived)

Name:_____ Date:_____
Teacher: _____

Please indicate how you think the intervention is going this week. Please circle the response that best describes this week of the intervention.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

The social skills group has interfered with my other classes

SD D A SA

The social skills group is distracting to other students

SD D A SA

I enjoy watching the social skills videos

SD D A SA

I enjoy going to social skills group

SD D A SA

I believe the social skills group is helping me

SD D A SA

I enjoy being part of the social skills group

SD D A SA

Additional comments:

APPENDIX H

TREATMENT INTEGRITY CHECKLIST

Social Skills Intervention Treatment Integrity Checklist

Facilitator:_____ Date:_____

Names of Students in Group:_____

Lesson Number:_____ Targeted Skill:_____

Instructions: **Put an X next to each step you have completed for each lesson**

Lesson Components	Session 1	Session 2	Component Integrity %
Conduct Check-Ins/ Transfer Powers			
Review Prior Skill	X	X	100%
Play Animation Video	X		50%
Play Peer Modeling Video			
Have Student Model Skill			
Play Game			
Free Time			
Snack/Goodbyes			
Total # of X's			
Session Integrity %			

APPENDIX I

SAMPLE INTRODUCTION AND INITIAL LESSONS

Introduction to the Program

Superheroes Social Skills is an eighteen-lesson social skills program that is run over eighteen or thirty-six weeks. It is designed to be taught in a small group format for children with high-functioning autism spectrum disorders (ASDs). The program is designed to appeal to non-disabled children as well. The ideal group composition would include some children with high-functioning ASDs and some non-disabled children who already have adequate social skills.

Although the title of the program sounds more like a fun video game, the program is an evidence-based approach to teaching social skills. This program combines highly engaging materials and activities with research-proven methods for teaching critical social skills to children with ASDs. The idea is to capture the children's attention, motivate them to participate, teach them important skills, and make the whole process fun.

Each of the eighteen skills is presented in two lessons given preferably over a one week period of time. Each lesson has the same format, rules, and motivation system. Each set of lessons varies in the type and steps of the different social skills being taught. The essential outline of each lesson includes:

-Checking In (Recording Skill Practice From Previous Week)
-Reviewing of the Posted Daily Schedule and Posted Group Rules
-Introducing the Social Skill and Watching the Superheroes Define the Skills and the Steps to the Skill on DVD
-Watching Peers Performing the Skill On the same DVD
-Role-playing the Skill with a Peer
-Watching the Superheroes Social Story Comic Book on DVD
-Engaging in a Social Game Based on the Skill
-Free Time and/or Snack
-Marking the Superheroes Power Poster with Power Charges Earned
-Group Reinforcement-Superheroes of the Day
-Explaining and Giving Homework (also putting finished Comic Books and Power Posters in each child's Superheroes Folder)
-Goodbyes

During the lesson, the motivation program is implemented by giving Scooter Cards for appropriate behaviors (following the Group Rules) and Black Hole Cards for inappropriate behaviors (see Technique Tips for Scooter/Black Hole Cards). The second part of the lesson later in the week differs by going over the Homework during Check-in and publicly posting skill practice by marking the Power Charges earned since last lesson to the Power Posters. In the second sessions, more free time for games is allowed. Each

of these features of the second sessions is designed to promote generalization of skills learned in the first session.

Technique Tips:
Scooter Cards/Black Hole Cards Reinforcement

--Laminate cards for re-use each week.
--Write a child's name on the back of a Scooter Card when it is earned.
--Use water-based marker so names can be wiped off and cards re-used next time.
--Do NOT put children's names on Black Hole Cards.
--Accumulate earned cards (both kinds) in a see-through container as they are earned during the session so children have a visual reminder of their chances for reinforcement (more Scooter Cards = better odds).
--When reinforcement time comes, draw one card to see who will be the Superheroes of the Day (keep drawing until a Scooter Card is drawn with a name on it).
--Have the Superheroes of the Day draw the next card. If a Scooter Card is drawn, the child can spin the spinner to determine which reinforcer will be given.
--If a Black Hole Card is drawn, no reinforcer for that day—better luck next time!

Starting the Lesson: Checking In (Materials-Name Tags, Checking Homework and Power Charges earned)

You may either have the children arrive independently or you may have to go and get them from their classrooms or waiting area, depending on the group level of functioning. Before the children arrive, put name tags around a large table or on chairs so they have the structure of knowing where to sit. As a lot of children with ASDs have difficulty with transition, this will assist in making the transition easier. When the children arrive, direct them to the spot next to their name tags if needed. It can help to have a digital photograph of the child on their name tag. Instruct each child put on their name tag (you may have to do this for some children) and say their name (or you say their name). Reinforce each child with a Scooter Card as they complete this process.

As the lessons progress through the program, check-in time is used to record skill practice during the week as recorded on the Power Card by parents and teachers. The facilitator marks the Power Poster with all the new power charges shown on the Power Card and puts the Power Poster up in the room. As this transfer is happening, the facilitator can ask the child, "How did it go?" and gather information that can be used later to develop scenarios for role-playing.

Technique Tips:
Lanyards

--In some school districts, break-away lanyards are required. Be sure to check your local rules.
--When the child puts on his or her lanyard, this becomes their signal to get ready and transition into the group. Don't give the child his lanyard until he is seated and ready.
--Keep lanyards in the room. Although the Power Cards can go home, the lanyards should stay.
--Vinyl badge holders protect the Power Cards from excess wear during the week. You may need to have extras on hand, however as they may not return as planned.

Review of the Daily Schedule and Group Rules

To get the session started, point out the visual Daily Schedule and Group Rules. The Rules should be posted on the wall, bulletin board, or white board within the children's eye sight. For younger children, the schedule and rules may need to be in pictures rather than words. The four rules of the group are:

Get Ready
Follow Directions
Be Cool
Participate

It should be noted that the four rules are also the skills of the first four lessons of the social skills program.

Make sure to initially explain each rule separately and what it means in concrete terms (for example, "Get Ready" means you are sitting in your chair, your eyes are on me, your hands and mouth are quiet.") Provide examples and non-examples, as well as a rationale as to why the rules are important. It is important that only the Group Leader or facilitator (no children) act out the non-examples of rule violations. Most children with an ASD find this very amusing. You can ask the children to tell you what you did wrong and how you could have followed the rule in a more appropriate way.

Next, you will need to explain to the children that they will be earning Scooter Cards when they follow the rules during group time. Black Hole cards are given out for each violation of a group rule. Start shaping the children to follow the rules immediately. For instance, if a child is paying attention while you are describing the rules, you could say the following: "I like how (child's name) is looking at me while I'm talking. That tells me that he is participating in what we are doing and makes me feel good. He earns a Scooter Card for following the rules."

For a child who is violating the rules, you could say, "(Child's name) is talking to his neighbor. That tells me he is not participating and I will have to put a Black Hole card in the container. Let's hope he does better at following the rules."

For the first session, use Black Hole Cards very sparingly because the children are still learning the rules. For the Introduction lesson, it might be most effective if you give yourself a Black Hole card when you don't follow the rules. The non-example scenarios are perfect for this. Reinforce positive behavior in at least a 4:1 ratio to inappropriate behavior. Remember to be consistent and provide specific feedback on what the child is doing right or wrong. The Scooter and Black Hole Cards will be used to reinforce the group at the end of the day. Explain to the group more Scooter Cards in the container means a better chance for a prize at the end of the session.

Technique Tip:
Keeping it Positive

To reduce the number of Black Hole cards given out in the group, first use Proximity Praise. For example, instead of pointing out the child that is breaking the rule, find a child that is close (proximity) and socially reward him for following rules. If the offending child then starts to behave, socially reinforce her also.

Reviewing the Daily Schedule and pointing to the posted pictures helps with transitions for the ASD child. If you have access to a digital camera and the group progresses, you can take pictures of the various children in the group doing the scheduled activity and post them on the wall. Even as the group becomes accustomed to the schedule, they still may want you to go over it briefly each week so they know what to expect. As the group meets in subsequent weeks, you can fade out the repetition of the rules unless someone violates a rule and needs a reminder.

Introduction of the New Social Skill and Watching the Superheroes DVD

Pass out the small Power Cards to each child (put on their lanyard) and post the corresponding Power Posters on the wall or nearby bulletin or white board with each child's name on it. Explain to the children that they will have the chance to gain power by following the steps to the targeted skill during each lesson. The Group Leader (the Leader could have his or her own Power Poster on the wall and Power Card on a lanyard) could model the social skills and mark a Power Card to show the children the process. Make a big deal about how the kids will compete with each other on how powerful they become over the course of the session. Emphasize that earning more Power Charges means they have more powerful Superheroes Social Skills. Prompt the children to look

up at the video screen. This is also a good time to pass out some Scooter Cards for children who are attending and watching the video screen.

By watching the animation video, the children will be introduced to one of the main characters (i.e. The Initiator, Interactor Girl, and/or Scooter the Robot) of the program. The Superheroes will name the skill and give the rationale why the skill is important. They will also learn the specific steps for the social skill through stick figures that are drawn. Again, remember to pass out Scooter Cards to children who are following the group rules to encourage the children to pay attention to the video screen and not disrupt others.

Watching Peers Performing the Skill On DVD

After the Superheroes have introduced the skill and the skill's steps have been demonstrated by watching the stick figure animation, the Superheroes will return and invite the children in the group to "Watch some kids do it." This provides a transition in watching actual children demonstrating the skill through the use of peer video-modeling. Again, remember to provide reinforcement to children who are watching the video, either through verbal praise or through the distribution of Scooter Cards for compliance.

Role-playing the Skill with a Peer

At the end of the video, the Superheroes will say, "Now let's see you do it!" Having the children participate in role-playing the steps to following directions, as well as putting all the steps together will help promote the generalization of these skills to other settings. Initially, the Group Leader should model each of the steps, including some non-examples. Next, the Leader should have each child in the group role-play each step to the skill, providing a Power Charge on their Power Card for successful attempts. If the child does not perform the step correctly, an error correction process should occur instantaneously so the child learns the correct way to perform the step. After the children have successfully learned each step, you can divide them into pairs to practice putting all the steps together. The children can pick role-plays from the Scenario Cards at the end of each lesson or come up with their own scenarios.

Technique Tip:
Self-as-a Model Video

-- If time and technology permit, you can video-record the children while they perform their role-plays. Make sure to follow confidentiality guidelines--obtain signed consent to video-record and permission to distribute copies to children in the group or make sure you only tape one child at a time and distribute copies only to that child.

--If you video-record a child, make sure you keep only the correct demonstrations of the skill. Edit out errors or mistakes the child makes.

These videos can then be used in the next session instead of replaying the video of peers demonstrating the skill. This approach is called "self-as-a-model" and has been shown to be very effective in teaching new skills.

Watching the Superheroes Social Story Comic Book on DVD

After the role-plays, guide attention back to the video screen and play the Social Story Comic Book for the skill you are trying to teach. As the Social Story Comic Book plays, point out the problem the Superheroeses are having (i.e., type of problem, where they are, who else is there). When the blank bubbles appear, ask the children in the group what should happen.

You may have to pause the video, as it will provide answers after the blank bubbles are presented. Solicit as many comments as possible. Tell the children they will need to work on the Social Story Comic Book solution with their parents at home and they can earn Power Charges for writing good solutions in the blank bubbles in their own Social Story Comic Book as homework. Review the solutions during the Review time at the beginning of the next group meeting.

The Social Story Comic Book time is a good time to serve snacks to the group while they are at the table. Remember to reinforce the children with Scooter Cards for appropriate behavior and use this time as an incidental learning opportunity to give Power Charges to their Power Cards as well.

In the second session for the social skill, review the solutions for the Social Story Comic Book the children brought back as homework from their parents at the beginning of the group.

Engaging in Social Game Based on the Skill

The first part of each lesson set includes a special group game that is based on the social skills you are teaching. For example, a variation of Simon Says is the game for the Following Directions skill and Play Turtle is the game for lesson on reducing anxiety. The group game is a prime time to catch students demonstrating the skill you are trying to teach. These are *incidental learning* opportunities and you have to be vigilant in catching children doing the skill. It helps if you say "I caught _____ doing the skill of the day. I'm going to mark her Superheroes Power Card." The group game should be fun and a way of giving lots of opportunities for the children to practice the social skill while playing.

Make sure you do not always catch the same child doing the skill. You might have to stretch it, but make sure all the children get caught at some time doing the skill. In the second session of each lesson set, time is allowed for small group (2-3 people) games and toys. (See the section on Free Time for game and toy suggestions.)

Free Time and/or Snack

Provide several games and/or toys for the group members to play with during free time. Age-appropriate games are especially useful for practicing social skills. Shortened versions of games may be necessary to fit within the time frame. Again, when the children are demonstrating social skills during play, you can mark Power Charges on their Power Cards give them or Scooter Cards or provide error correction when necessary.

Technique Tip:
Games and Toys

It helps to have toys or games that require at least two students to participate such as tic-tac-toe, checkers, ping pong, catch with a ball or Frisbee, gestures like charades, team tag, Jenga®, Sorry®, Uno®, Go Fish, etc.

Snacks can also be served during the Free Time period if they were not served during the Social Story Comic Book time.

Technique Tip:
Helpers

Have two or more students help you with the snacks and reinforce them with Scooter Cards for helping.

Marking the Power Poster with Power Charges Earned on the Power Card

When free time is finished, it is time to mark all the Power Charges earned during the session on the Power Posters posted in the classroom. It helps if you give the water-based pen to the student and have them self-record the number of Power Charges they earned from their Power Cards as they participated in the role-play and in free time.

Tell the children that if their parents or teachers "catch" them doing the skill during the week they can get more Power Charges by having the parent or teacher mark their card. Show them the place on the back where a parent and teacher need to sign each week to verify that only the adults marked the cards. This is meant to discourage children from filling up their own Power Cards without demonstrating the skills. The more Power Charges earned, the more Superheroes Social Skill power they will have. Power Posters can be updated at this time in the session and during check-in of the next session. Public posting of the "powers" earned is an incentive to practice outside the group.

Technique Tip:
Modeling

If you have your own Superheroes Power Card and Poster, it helps to mark it and then show how another student has more Power Charges marked and you are going to try and catch up with them by practicing your skills and doing your homework this week!.

Group Reinforcement-Superheroes of the Day

In order to motivate the group to put their games or toys away and get ready to leave the session, save reinforcement for the last activity of the session. Make a big deal about Reinforcer Time and who might be the Superheroes of the Day. The idea is to generate excitement. This incentive will help with transition from the group back to the classroom or home.

All of the Scooter Cards (with student's names on the back) and Black Hole Cards earned during the session should be in a container already. It is important that the children not be able to see which ticket they are choosing, so block the view or raise the container where they can't see it for the drawing. The first card drawn will be for the Superheroes of the Day. If a Scooter Card is drawn, the person's name on the back of the card is the Superheroes of the Day. If a Black Hole card is drawn, keep going until a Scooter Card is drawn and a Superheroes of the Day is chosen.

The second card drawn will determine if the group gets a reinforcer or not. The Superheroes of the Day draws a card from the container. If it is a Scooter Card, then the Superheroes of the Day gets to spin the reinforcement spinner for the group. If it is a Black Hole card, no reinforcer for the group—better luck next time.

Technique Tip:
Reinforcement Spinner

--When you create or buy your spinner, mark the areas unevenly. Large areas (high probability) can contain smaller or less valuable prizes, treats, or privileges. Smaller areas (lower probability) can contain more valuable, more exciting prizes, treats, or privileges.

--Make sure the reinforcers are motivating for the group by letting them help you choose reinforcers on the spinner periodically.

Explaining and Giving Homework

The homework component of this program is an essential element for the generalization of the newly learned social skills. The parents will need a set of materials to do the homework. These include the Superheroeses' DVD, extra Superheroes Power Cards (in case of lost cards), and paper copies of the Social Story Comic Book Social Stories.

Technique Tip:
Comic Book and Power Cards

Although the Comic Books and Power Cards can be printed at home from the CD, the appearance of the materials may be variable due to availability of color printers at home. Comic Books have the best appearance when printed double-sided, in full color on card stock. Power Cards are easiest to pull out of vinyl sleeves if they are printed on heavy card stock (over 110 lb. or "cover" stock). If all materials are printed in advance by the school or clinic, there is no need for parents have a CD to print materials from and all materials are equal in quality and appearance.

In a separate meeting with all the parents of children in the group before the program starts, explain to them that at least three times a week they are expected to watch the Superheroes DVD with their child for the skill that is currently being taught. They are also expected to help the child fill in the bubbles for the Social Story Comic Book that will be returned for review in the next group session.

Also, across the week ask the parent to catch (at least 3 to 5 times during the week) their child doing the appropriate social skill and mark a Power Charge on the Power Card. Both the Social Story Comic Book and the Superheroes Power Card are returned for review in the second group session. All parents should receive the entire Homework Package (containing one Superheroes DVD, 18 extra Superheroes Power cards, and 18 hardcopy Social Story Comic Books) at the special parent meeting before the training starts.

Remind the children that there are three ways to get more Power Charges:

(1) Watch the DVD three times with their parents.
(2) Fill in and color the back page of the Social Story Comic Book.
(3) Practice their new skills at home and school.

When a child's teacher or parent "catches them" attempting or performing a social skill and applying each step, or doing the assigned homework, they will add Power Charges to their cards by filling in the circles on the card.

In the parent meeting, explain that, initially, children can get Power Charges for showing their parent or teacher partial skills until they can do the entire skill at once. After that, only entire skills can earn Power Charges. They can also get power from watching the DVD and working on the Social Story Comic Book at home. Emphasize it is important to bring the Power Card and Social Story Comic Book to the next meeting so they have a chance to increase their Power Charges, mark their Power Posters, and earn Scooter Cards.

Keeping a Record of Progress Made

When the Social Story Comic Book and Power Cards are returned after the second session and the next lesson set begins, they should be put in the student's Superheroes notebook or folder. When the two lessons are over, the Power Posters from the wall should also be put in the student's notebook. Children may wish to keep their Power Cards with them to continue practicing skills, which helps them to continue to generalize their skills. As they continue in the program, they will earn a full deck of skill cards to remind them of the skills they have learned. Over time, the notebook will be a record of the student's achievements and successes in the group.

Goodbyes

Remind the children to work on their new skill during the week at home and at school so they can earn Power Charges on their Power Cards. They can only post Power Charges to their Power Posters if they remember to bring them next time!

Technique Tip:

Find a way to attach the Power Card to the child's backpack to ensure that it is available at home and school for parents and teachers to mark it, as well as return it to the next session. A second vinyl badge holder can

be attached to the backpack or the original vinyl badge holder can be removed from the lanyard and clipped to the backpack. Many backpacks have small special pockets that might also be useful.

SUPERHEROES SOCIAL SKILLS LESSON PLAN **Foundational Skills 1--Lesson 1** **Skill: *Following Directions*** ****Prerequisite: Introduction Lesson**	
Objective	**Group members will be able to demonstrate the 4 steps to following directions within 3 to 5 seconds in the session, at home, and at school.**
Rationale	**If you follow directions quickly, you will make the person happy and you will know how to do something correctly the first time. People will know that you are listening to what they are saying or asking you to do.**
Steps to Following Directions	***1. Look at the person*** ***2. Listen to their words*** ***3. Nod your head or say okay*** ***4. Do what the person asks right away*** ***(Make sure to discuss situations where you don't have to follow directions—strangers, directions that would harm, etc. at an appropriate point)***
Materials Needed	**DVD #1 FOLLOWING DIRECTIONS Lesson, DVD Player & TV or computer** **Power Card #1 Following Directions for each** **Power Poster #1 Following Directions for each** **Following Directions Scenario Cards** **Comic Book #1 Following Directions** **Scooter Cards, Black Hole Cards, lanyards, reinforcers, spinner, water-based markers**

Starting the Lesson:

Check in	Review names, use name tags again if necessary.
Daily Schedule and Group Rules	Post schedule and rules ***Remind them they can earn Scooter Cards for following rules, Black Hole Cards for not following rules.*** 1. Get Ready **2. Follow Directions (today's lesson)** 3. Be Cool 4. Participate
Introduce new skill and power card	Skill: Following Directions (state rationale) **POWER CARD #1: FOLLOWING DIRECTIONS**
Watch Video	**DVD #1: FOLLOWING DIRECTIONS (Play All)**

Role-plays	**Option: Video-record role-plays for self-as-model DVD** 1. Facilitator shows non-example, allow group to correct example *A teacher (child in group)) tells the class that it is time to clean off your desk and line up for recess. Facilitator (role-playing the student) does not comply. Exaggerate non-compliance of each step.* 2. Facilitator does another example, this time a positive one. *A teacher (child from group) tells a "student" (facilitator) to take out his/her reading book and read quietly (facilitator complies). Show the steps clearly.* 3. Facilitator third example, a scenario when you DON'T have to follow directions. *Another child tells a "student" (facilitator) to give him his lunch money (bullying situation). Facilitator thinks out loud and decides he doesn't know or trust this person very well and does not comply.* 4. Group members take turns role playing scenarios with facilitator giving directions for them to follow ***FOLLOWING DIRECTIONS SCENARIO CARDS** can be used or children can make up their own* Facilitator emphasizes each step as it occurs, provides error correction 5. As each child demonstrates the steps during role-plays, mark a power spot on the **POWER CARD #1.** *Emphasize that participating means they are following directions.*
Social Story Comic Book On DVD	Watch the **DIGITAL COMIC BOOK** on **DVD #1, FOLLOWING DIRECTIONS LESSON** The video will ask some multiple choice questions to fill in the blank bubbles. It will pause and give an answer, but explore other answers given with the group.
Social Game	Scooter Says (Simons Says) *Facilitator can assist group members to take turns being "Simon" or "Scooter"*

Free Time and Reinforcement	Incidental teaching and error correction. Provide games and toys for social play. Use **SCOOTER CARDS** (Write name on back) for following rules and following directions Use **BLACK-HOLE CARDS** for noncompliance Mark Power Cards as children show the steps to Following Directions At end of free time, draw a card for Superheroes of the Day, have that child draw to see if group gets a reinforcer. Use **SPINNER** to determine **REINFORCER** **Options: Group Project Development time** **Examples: Develop own Superheroes—decide on a name and mission** **Put together video motivator project—decide on a title for video**
Power Poster Update	Allow group members to update their **POWER POSTERS** with the Power Charges they have earned during role play and free time.
Explain Homework	1. Watch **FOLLOWING DIRECTIONS LESSON DVD #1** every day at home. 2. Earn Power Charges on **POWER CARD #1** by following the steps at home and school. 3. Have parents and teachers mark and sign the **POWER CARD**, <u>bring it back next time.</u> 4. Color in the **COMIC BOOK #1** and fill in the empty thought bubbles. <u>Bring it back next time.</u>
Goodbyes	Time to provide **REINFORCERS** and transition out

SUPERHEROES SOCIAL SKILLS LESSON PLAN **Foundational Skills 1--Lesson 1** **Skill: *Following Directions*** ****Prerequisite: Introduction Lesson**	
Objective	**Group members will be able to demonstrate the 4 steps to following directions within 3 to 5 seconds in the session, at home, and at school.**
Rationale	**If you follow directions quickly, you will make the person happy and you will know how to do something correctly the first time. People will know that you are listening to what they are saying or asking you to do.**

Steps to Following Directions	***1. Look at the person*** ***2. Listen to their words*** ***3. Nod your head or say okay*** ***4. Do what the person asks right away*** ***(Make sure to discuss situations where you don't have to follow directions—strangers, directions that would harm, etc. at an appropriate point)***
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